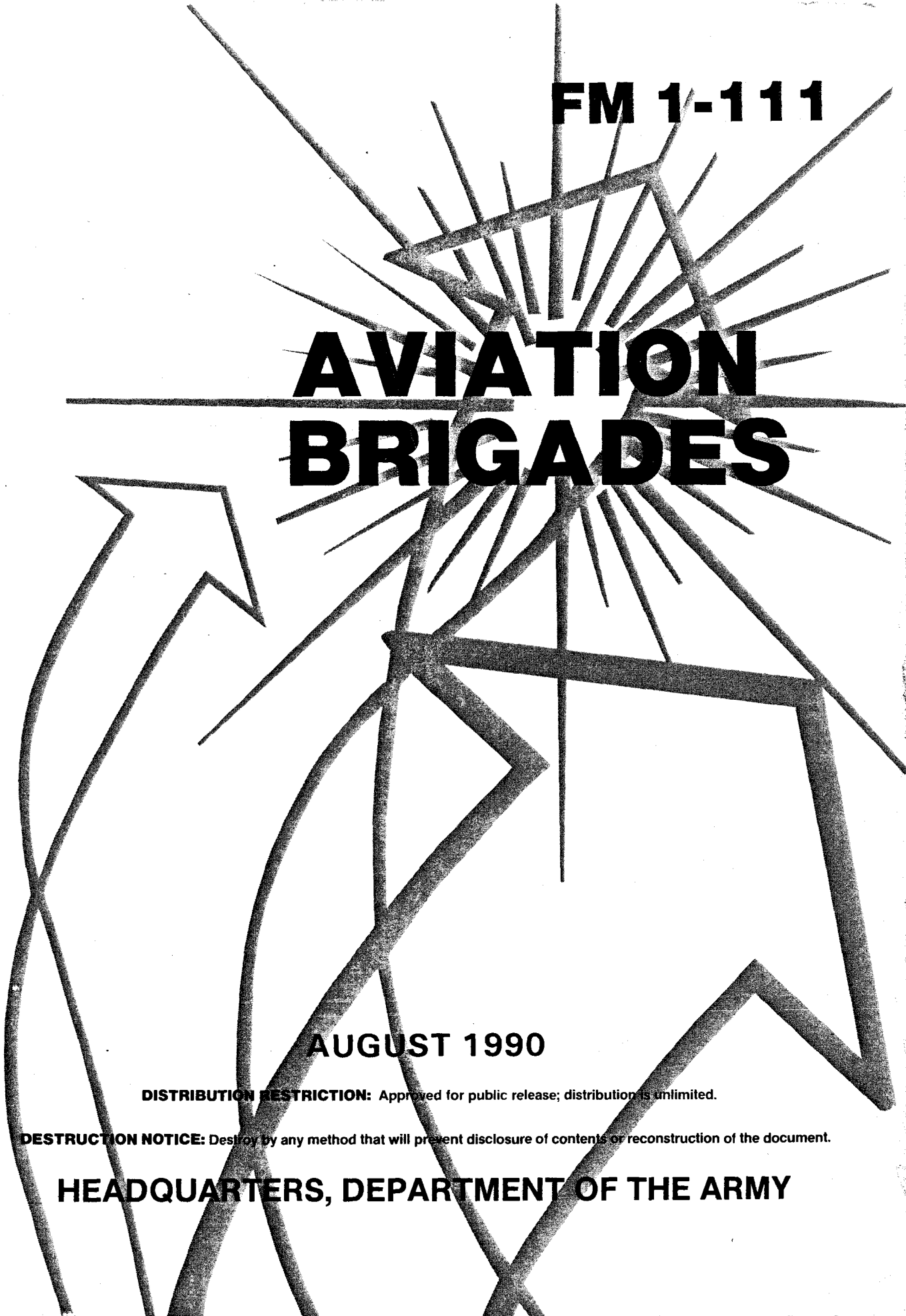




FM 1-111

AVIATION BRIGADES

AUGUST 1990

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HEADQUARTERS, DEPARTMENT OF THE ARMY

AVIATION BRIGADES

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*This publication supersedes FM 1-111, 12 August 1986.

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PREFACE

This manual is a doctrinal and tactical guide for employing aviation brigades in combat. It describes the organizational structure of all aviation brigades at echelons above corps, corps, and division. It also describes command, control, and communications; combat support; and combat service support for brigades. Appendix A describes the theater aviation battalion assigned to aviation brigades at echelons above corps. Appendix B describes the theater defense aviation battalion. Although the TDAB is not organic to any aviation brigade, it may be employed in a theater of operation with aviation brigades. Appendixes C through J discuss risk management, low-intensity conflict, NBC operations, air combat operations, JAAT operations, A²C², self-deployment, and deep operations. The operational concepts in this manual are based on AirLand Battle doctrine as established in FM 100-5 and the employment principles described in FM 1-100. The basis for organizations described in this manual is the L-series tables of organization and equipment.

Success on the battlefield depends on the synergistic efforts of joint, combined, and combined arms forces. Aviation brigades provide a unique capability to the commander as a land component force on the modern battlefield. Aviation brigades are organized and equipped to provide unity of command over aviation assets. In the maneuver role, aviation brigades are ideally suited to fight on an integrated, nonlinear battlefield that is characterized by extended fronts and multiple operations. As organized, the aviation brigade is not a maneuver brigade. However, as command and control headquarters, aviation brigades may be task-organized with maneuver and support units of the combined arms team to conduct the spectrum of combat operations. With the combined arms capabilities of their own combat maneuver forces, aviation brigades have the ideal balance of firepower and maneuverability to create windows of opportunity for gaining the initiative and entering the enemy's decision cycle.

This manual is intended for theater, corps, division, and brigade commanders and their staffs. This publication will also be used by all aviation commanders and staff officers within aviation units and by all soldiers of those organizations. Aviation commanders must know how to employ and operate their respective organizations; ground commanders must be concerned chiefly with how to employ these units.

The proponent of this publication is HQ TRADOC. Submit changes for improving this publication on DA Form 2028 (Recommended Changes to Publications and Blank Forms), and forward it through the aviation unit commander to Commander, US Army Aviation Center and Fort Rucker, ATTN: ATZQ-CAT-DD, Fort Rucker, AL 36362-5263.

The provisions of this publication are the subject of international agreements:

STANAG	QSTAG	AIR STD	
2002	501	84/10	Warning Signs for the Marking of Contaminated or Dangerous Land Areas, Complete Equipments, Supplies and Stores
2014	506		Operation Orders, Warning Orders and Administrative/Logistics Orders
2019	509		Military Symbols for Land Based Systems--APP-6
2047	183		Emergency Alarms of Hazard or Attack (NBC and Air Attack Only)
2103	187		Reporting Nuclear Detonations, Biological and Chemical Attacks, and Predicting and Warning of Associated Hazards and Hazard Areas--ATP-45
2104	189		Friendly Nuclear Strike Warning
2404			Joint Antiarmour Operations (DRAFT)
2868			Land Force Tactical Doctrine--ATP-35(A)
2889	742		Marking of Hazardous Areas and Routes Through Them
2999			Use of Helicopters in Land Operations--ATP-49
3497			Aeromedical Training of Aircrew in Aircrew NBC Equipment and Procedures
3805		45/6B	Doctrine and Procedures for Airspace Control in the Combat Zone--ATP-40
	277		Procedures for the Employment of Helicopters in the Antiarmor Role
	586		Procedures in the Event of a Downed Helicopter
	768		Terrain Flight

Unless otherwise stated, whenever the masculine gender is used, both men and women are included.

This publication has been reviewed for OPSEC considerations.

CHAPTER 1

AIRLAND BATTLE DOCTRINE

This chapter implements portions of STANAG 2868 (Edition Four).

The aviation brigade is organized and equipped to support AirLand Battle doctrine. This chapter describes the role of aviation brigades according to AirLand Battle doctrine. It provides the organizational structures of the various aviation brigades in echelons above corps, corps, and divisions. The missions are also described for each echelon aviation brigade. Capabilities and limitations of aviation brigades are described as they generally apply.

Section I

AIRLAND BATTLE OPERATIONS

1-1. DOCTRINE FUNDAMENTALS

Aviation brigades provide unity of command for all aviation assets. Thus they synchronize maneuver within the third dimension of the modern battlefield to support land forces conducting combat operations. The speed and mobility of an aviation brigade allow it to cover close, deep, and rear operations. Aviation brigades perform maneuver, combat support, and combat service support in all three areas of operations at the same time. They can quickly move from one area of operations to another to disrupt an enemy concentration of forces.

a. Tenets of AirLand Battle Doctrine. AirLand Battle doctrine requires worldwide strategic mobility and warfighting capabilities across the spectrum of conflict. This doctrine stresses the three-dimensional nature of modern warfare. Success for aviation brigades on the modern battlefield depends on their ability to fight according to the four basic tenets of AirLand Battle doctrine: initiative, agility, depth, and synchronization.

(1) Initiative. Commanders set the tempo of combat by seizing or retaining the initiative. Aviation brigades are ideally suited for seizing the initiative. Initiative includes maintaining the offensive spirit, acting quicker than the enemy, and executing aggressive and offensive maneuvers while accepting calculated risks.

(2) Agility. The speed of aviation forces allows commanders to act faster than enemy forces can react. Exploiting the agility of aviation brigade forces requires a thorough intelligence preparation of the battlefield. Speed and mobility are necessary to project combat power against enemy vulnerabilities when windows of opportunity are created or identified. Complete units may have to reposition themselves rapidly in a single movement operation. Aviation brigade operations may be focused directly against the

Threat's conventional or tactical centers of gravity--high-value targets. Aviation brigade leaders must maintain flexible offensive postures by force disposition and by mindset to retain agility.

(3) Depth. Depth for aviation brigades refers to space on the battlefield, resources, and preparation. Depth further implies preparedness throughout the spectrum of operations. It also prescribes staying power and resolve in asset employment and unit readiness. Aviation brigade operations, independent of the ground lines of communication, allow force commanders to project depth throughout all areas of operations.

(4) Synchronization. Synchronization is the key to successful AirLand Battle operations; but it may also be the most difficult tenet to achieve. Integrating aviation assets into planning helps synchronize actions against the enemy. Synchronization thus enhances the combat power of the total force. Chapter 3 further describes this tenet.

b. Imperatives of AirLand Battle Doctrine. While initiative, agility, depth, and synchronization characterize successful AirLand Battle operations, the imperatives listed below prescribe key operating requirements. FM 1-100 describes, in detail, the AirLand Battle imperatives. These imperatives apply to all aviation brigades. Aviation brigade commanders must--

- Ensure unity of effort.
- Anticipate events on the battlefield.
- Concentrate combat power against enemy vulnerabilities.
- Designate, sustain, and shift the main effort.
- Press the fight.
- Move fast, strike hard, and finish rapidly.
- Use terrain, weather, deception, and OPSEC.
- Conserve strength for decisive action.
- Employ combined arms and other services to complement and reinforce.
- Understand the effect of battle on soldiers, units, and leaders.

1-2. ORGANIZATION

Aviation brigades are assigned at EAC, corps, and division levels. Individual brigades differ based on their higher headquarters, units, location, and missions.

a. All aviation brigades have the same basic mission. That is, they find, fix, and destroy the enemy through fire and maneuver; they also have unity of command over aviation assets. They provide CS and CSS in

unity of command over aviation assets. They provide CS and CSS in coordinated operations as an integrated member of the combined arms team. Aviation brigades may perform integrated joint or combined operations at all levels. However, the level of operations and the degree to which they are conducted differ depending on the echelon of organization (EAC, corps, or division).

b. During maneuver operations, aviation brigades perform attack, reconnaissance and security, air assault, air combat, special operations, and C³I enhancement. CS missions include fire support functions, C³I, search and rescue, aerial mine warfare, IEW missions, and air traffic services. During CSS operations, aviation brigades perform air movement of personnel, equipment, and supplies; aeromedical evacuation missions; and aviation maintenance.

Section II

ECHELONS-ABOVE-CORPS AVIATION BRIGADES

1-3. MISSION

EAC aviation brigades support echelons-above-corps operations. They perform maneuver, CS, and CSS functions based on the operational requirements of the theater of operations. EAC aviation brigades also conduct integrated joint and combined maneuver operations in support of theater campaigns; in addition, they provide support to theater special operations forces. However, EAC aviation brigades mainly provide C³I enhancement, CS, and CSS air movements for theater army operations. That is, they serve primarily as force providers.

1-4. STRUCTURE

Each EAC aviation brigade is designed, tailored, and configured for the specific theater. The brigade may be organized with attack, reconnaissance, assault, or medium helicopter units or a combination of these to meet the requirements of the theater army. A typical aviation brigade at EAC may consist of--

- One headquarters and headquarters company.
- One ATS battalion or company.
- One theater aviation battalion.
- One medium helicopter battalion.
- Two attack helicopter battalions.

Although not assigned, an aviation maintenance battalion may be collocated with the brigade to provide aviation intermediate maintenance and depot support. Figure 1-1 shows an example of an EAC aviation brigade.

AIRCRAFT REQUIREMENTS

5 U-21	32 CH-47
31 OH-58	30 UH-1
36 AH-64	36 UH-60

TOTAL ACFT RQMT = 170

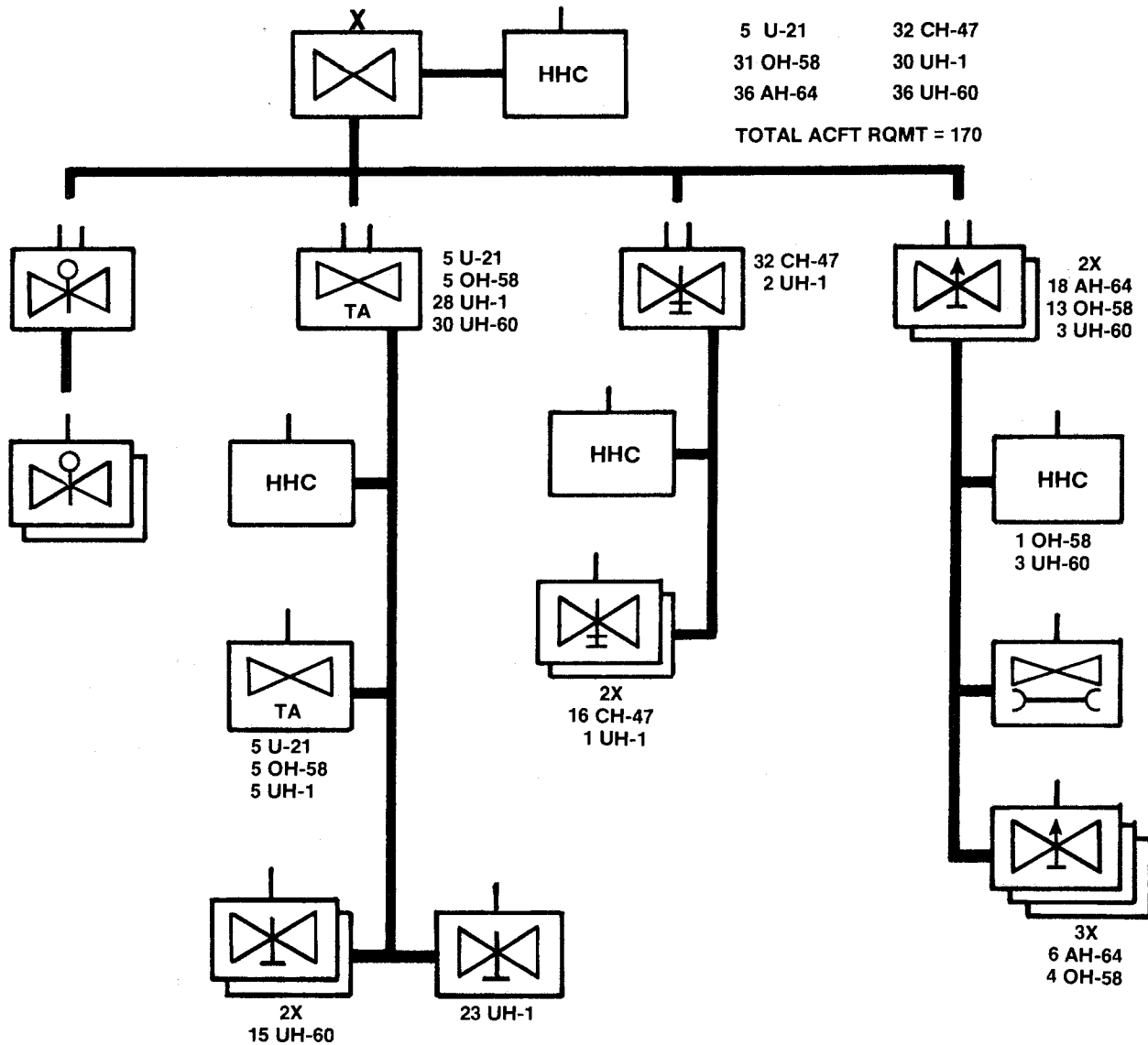


Figure 1-1. Example of an EAC aviation brigade

Section III

CORPS AVIATION BRIGADES

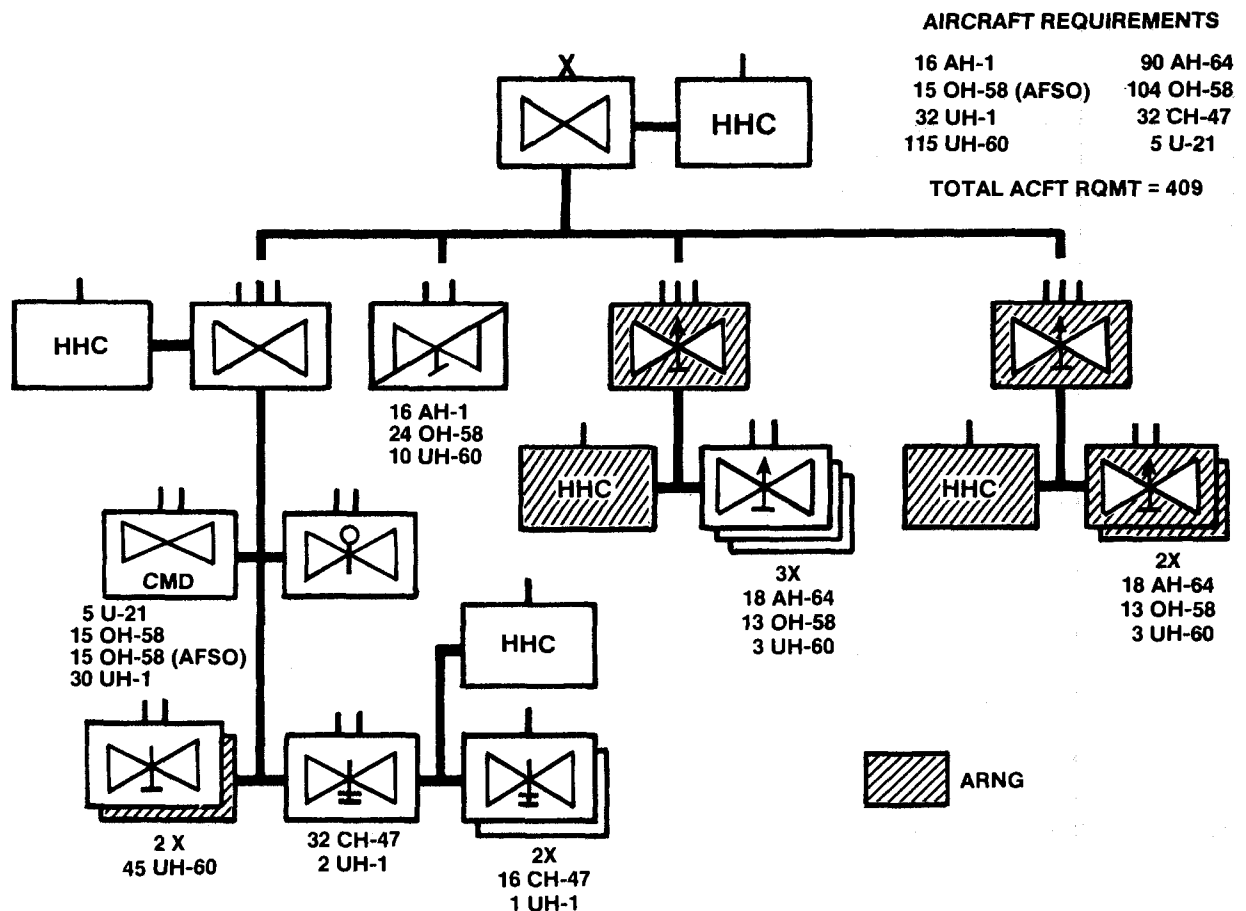
1-5. MISSION

The corps aviation brigade conducts a full range of maneuver, CS, and CSS functions. It plans, coordinates, and executes aviation and combined arms

operations to support the corps scheme of maneuver. Attack helicopter units of the brigade destroy enemy forces by fire and maneuver. Assault and medium helicopter units move combat personnel, supplies, and equipment for corps operations. Other units provide aircraft and equipment to enhance C³I.

1-6. STRUCTURE

a. Each Army corps is assigned an aviation brigade to support corps operations. The corps aviation brigade has unique maneuver capabilities; these enable the corps commander to focus mainly on high-tempo aviation operations. The corps aviation brigade assists the corps commander in shifting the balance of combat power to his advantage, especially when it is employed with other members of the combined arms team. The corps aviation brigade also employs attack, reconnaissance, assault, and medium helicopters to exploit the third dimension of the battlefield; both rotary-wing and fixed-wing assets are used for C³I. The corps aviation brigade is composed of one headquarters and headquarters company, one aviation group, and two attack helicopter groups. Figure 1-2 shows an example of a corps aviation brigade.



b. All corps aviation brigade structures stem from this basic design. The exact number of units assigned depends on many factors. The most critical is the location and mission of the parent corps. The aviation group has two assault helicopter battalions (UH-60), one medium helicopter battalion (CH-47), one command aviation battalion, and one ATS battalion. The attack helicopter groups vary in size. They may have up to four attack helicopter battalions each. In the corps with no armored cavalry regiment, an air reconnaissance squadron is assigned to the corps aviation brigade. Although unable to perform all missions of the ACR, this squadron can perform reconnaissance and screening operations. The brigade headquarters plans and conducts the multiple missions normally required in combat. The subordinate attack helicopter groups and aviation group also have tactical planning headquarters elements; these elements coordinate and execute pure aviation brigade or combined arms operations when task-organized.

Section IV

DIVISION AVIATION BRIGADES

1-7. MISSION

The division aviation brigade finds, fixes, and destroys enemy forces; it uses fire and maneuver to concentrate and sustain combat power at the critical time and place. The division aviation brigade can accomplish this mission as a pure-aviation brigade or as a task-organized force. This brigade also--

- Provides timely reconnaissance and intelligence throughout the division area.
- Masses attack helicopter fires.
- Shifts reserves quickly.
- Conducts air assault and air movement operations.
- Enhances C³I for the division commander.
- Provides unique capabilities for the division commander. These include antiarmor, antipersonnel, air assault, and air movement operations.

1-8. STRUCTURE

Division aviation brigades are designed to support each Army division. The aviation brigade provides the division commander with another capability to shape the battlefield. The division aviation brigade further provides him with the ability to plan and coordinate maneuver operations as well as CS and CSS. Aviation brigades are organic to all Army divisions. However, the organization of the brigade depends on the type of division--heavy, light,

airborne, or air assault--it is assigned to. The missions are primarily the same for all division aviation brigades; however, these missions may vary because each organization is unique.

a. Heavy Division Aviation Brigade. Heavy divisions are normally employed in mid- to high-intensity conflicts against another armored or mechanized force. Aviation brigades in heavy divisions are also employed mainly in the antiarmor role. The aviation brigade in the heavy division is composed of--

- One headquarters and headquarters company.
- One cavalry squadron.
- Two attack helicopter battalions.
- One assault helicopter company.
- One command aviation company.

The aviation maintenance company in the division support command provides AVIM for this brigade. Forward-deployed units are assigned two attack helicopter battalions; CONUS-based units are assigned one. Figure 1-3 shows the aviation brigade of the heavy division.

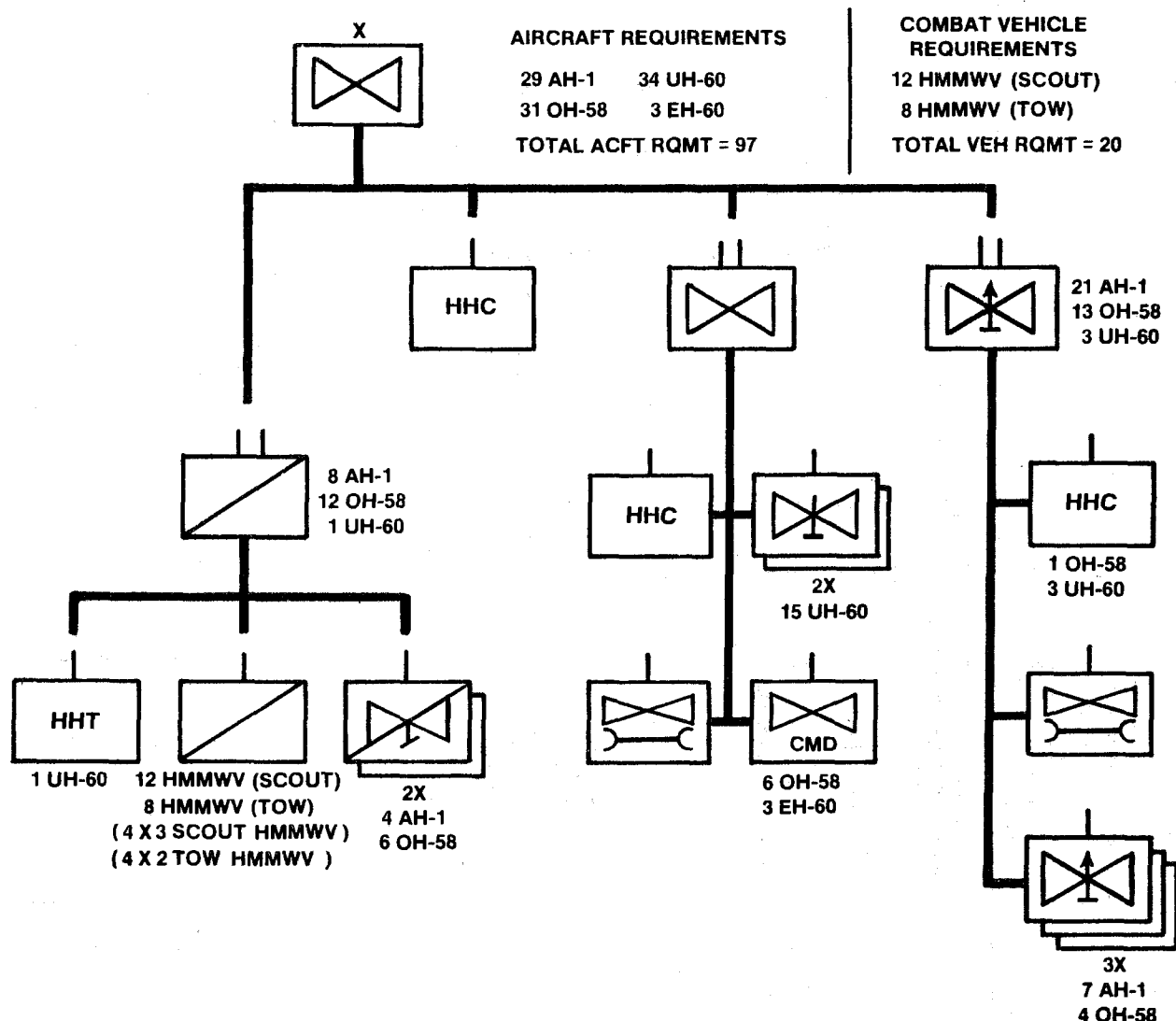


Figure 1-4. Aviation brigade, light division

c. Airborne Division Aviation Brigade. The airborne division generally fights like any other US Army division. It is organized in much the same way as the infantry division; its aviation brigade is employed like that of the brigade in light infantry divisions. The structure of the aviation brigade in the airborne division is identical to that of the aviation brigade in the light division with one exception. This brigade has an organic air reconnaissance squadron as described in FM 1-117. The aviation brigade in the airborne division can rapidly deploy worldwide. It provides aviation forces for antiarmor and antipersonnel operations and air assault and air movement operations after the airhead or forward operating base is established. The

aviation brigade in the airborne division also conducts extensive joint and combined operations. Figure 1-5 shows the aviation brigade of the airborne division.

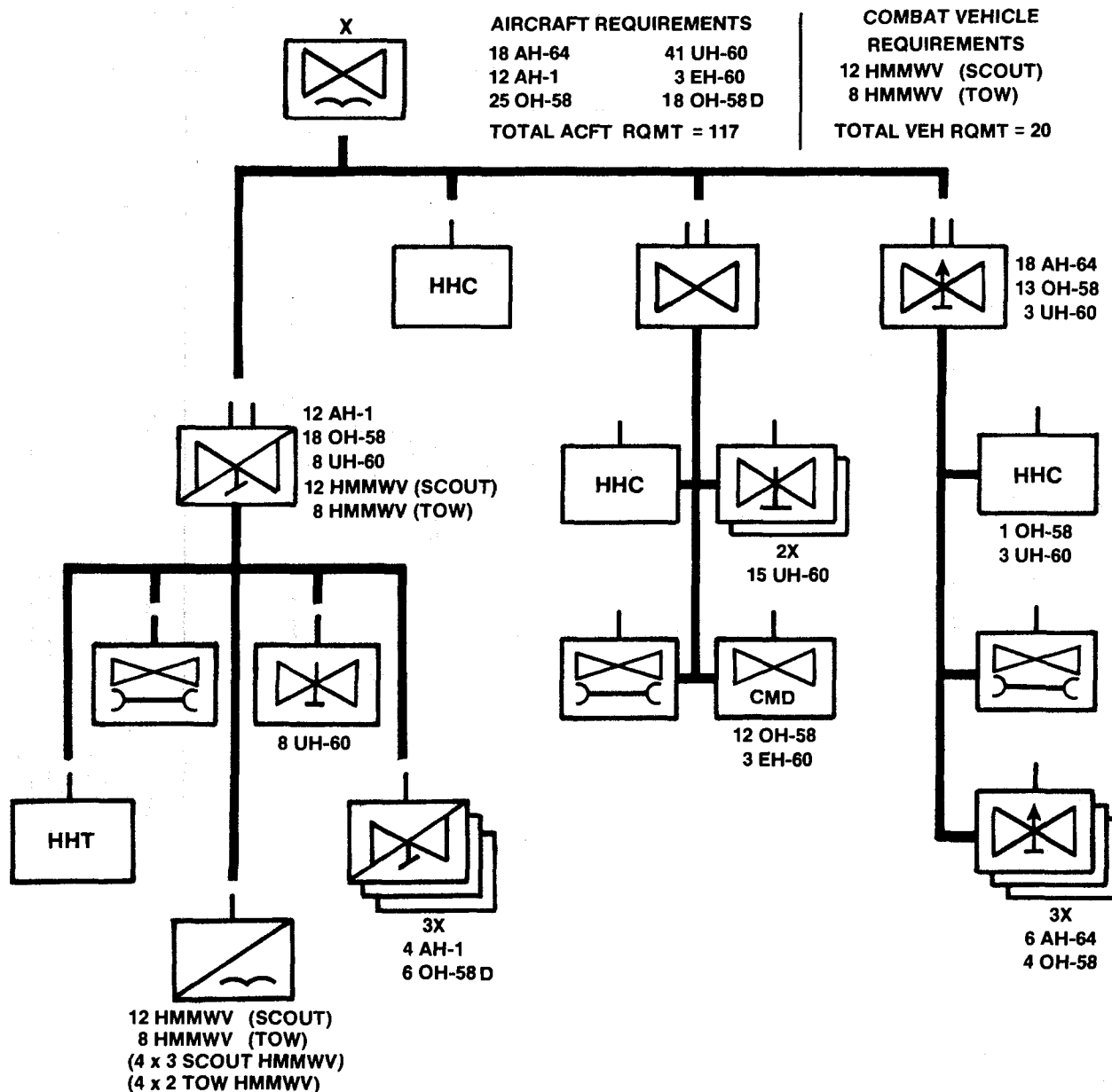


Figure 1-5. Aviation brigade, airborne division

d. Air Assault Division Aviation Brigade. The air assault division is also unique but generally employed in much the same way as an infantry division. However, the air assault division operates across the entire depth and width of the battlefield. It must move rapidly anywhere with short notice. Therefore, it relies totally on its aviation forces. The aviation brigade also plans, coordinates, and executes aviation operations as an integrated

element of an air assault combined arms team. It can find, fix, and destroy enemy forces in joint or combined operations. It also provides most of the division's intelligence-gathering capability and antiarmor fires. The aviation brigade in the air assault division is composed of one headquarters and headquarters company, one air reconnaissance squadron, one command aviation battalion, one medium helicopter battalion, two assault helicopter battalions, and four attack helicopter battalions. Figure 1-6 shows the aviation brigade in the air assault division.

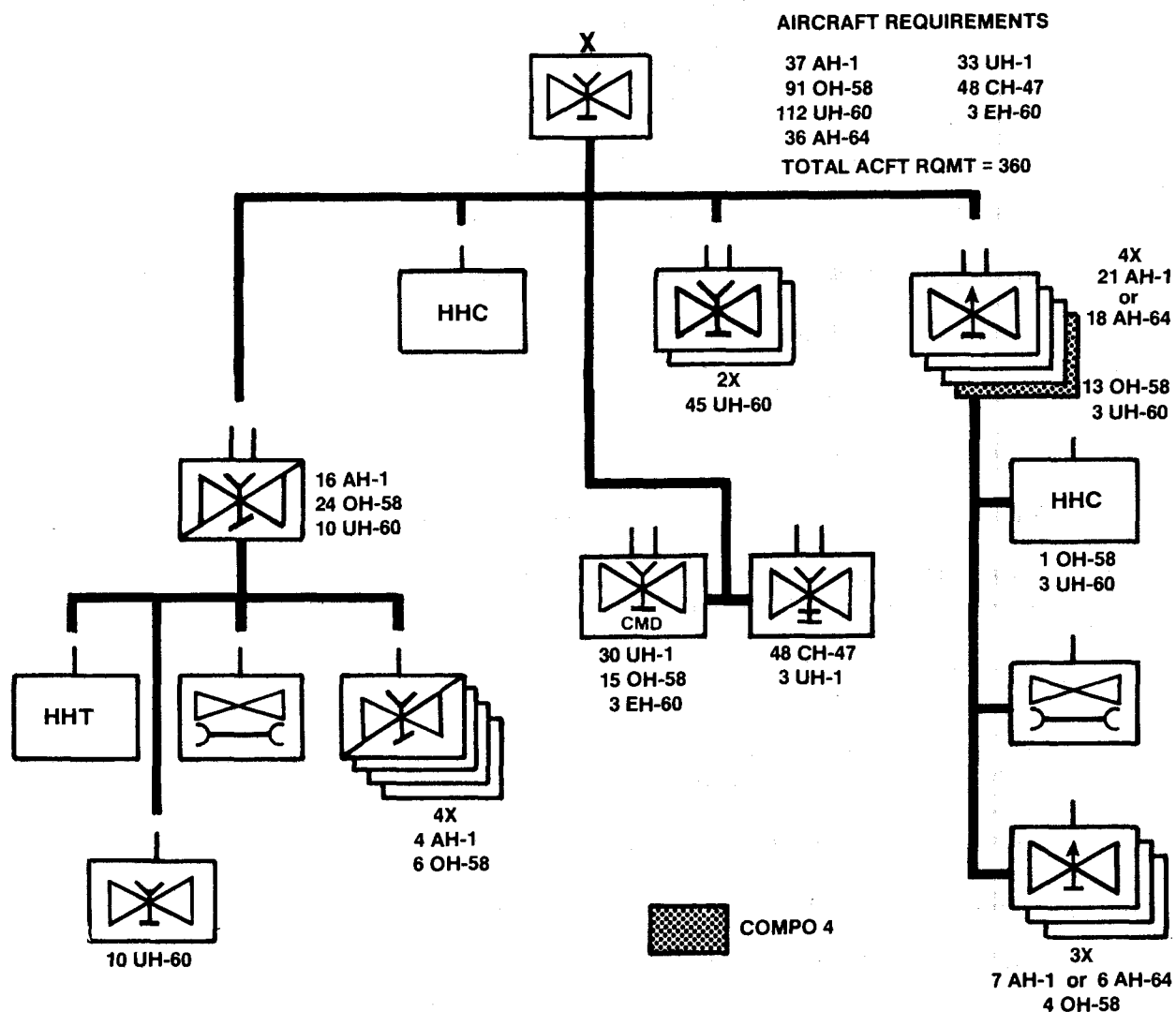


Figure 1-6. Aviation brigade, air assault division

Section V

CAPABILITIES AND LIMITATIONS

1-9. CAPABILITIES

The aviation brigade exploits the aerial dimension of the battlefield. However, employing the aviation brigade requires an understanding of its capabilities in relation to the battlefield. Aviation brigades can--

- Provide timely reconnaissance and intelligence throughout the theater, corps, or division area or a combination of these.
- Maneuver in the third dimension to influence the tempo of battle.
- Mass attack helicopter fires or shift reserves quickly.
- Rapidly maneuver forces to achieve mass at critical times and places.
- Conduct air combat operations.
- Conduct JAAT operations.
- Conduct SEAD operations.
- Conduct air assault and air movement operations.
- Weight the combat power of the theater, corps, or division commander or a combination of these.
- Rapidly reposition troops, equipment, and supplies for current and future operations.
- Conduct operations during day, night, limited visibility, and adverse conditions or environments.
- Provide air traffic services (corps level).
- Conduct airfield operations (corps level).
- Conduct combined arms operations.
- Conduct joint operations.
- Conduct combined operations with other nations.

1-10. LIMITATIONS

Aviation brigades are also subject to some limitations on the battlefield. These limitations are listed below.

- Weather and obscuration affect observation, acquisition, and engagement ranges of combat systems as well as the employment of all aviation forces.
- Reconnaissance assets have a limited capability to operate on wide frontages.
- Aviation brigades have a limited night capability when employing other than recently fielded technology such as that of the AH-64 and OH-58D. Night vision devices enable aviation forces to operate at night but require additional planning considerations.
- Aircraft consume large amounts of fuel, ammunition, and repair parts and require a distribution system across the entire battlefield.
- At extended ranges of operation, adequate combat support is often not available.
- The tempo of operations may be slowed when aviation brigades are augmented with ground maneuver units.
- Rapid and long-range movement strains the C³ of the controlling headquarters.
- An NBC environment may degrade or hinder the capability of aviation brigades.
- Commanders and staff must plan A²C² operations that preclude fratricide.
- Aviation brigades have a limited capability to secure unit assembly areas.
- Aviation forces require accurate, rapid, and fresh intelligence continuously.

CHAPTER 2

COMMAND, CONTROL, AND COMMUNICATIONS

This chapter implements portions of STANAGs 2014 (Edition Five) and 2019 (Edition Three).

The complexity of the modern battlefield, marked by the advent of new concepts and lethal weapon systems, demands the most effective and efficient command and control. To achieve a decisive advantage over his opponent, the commander must be able to command and control his forces in nonlinear maneuver battles. Thus he must use initiative, depth, agility, and synchronization. The overall command and control system the Army uses for tactical operations is the Army tactical command and control system, described in FM 101-5. This chapter covers those areas unique to aviation brigades that apply to the command and control process, organization, facilities, communications, liaison operations, and OPSEC.

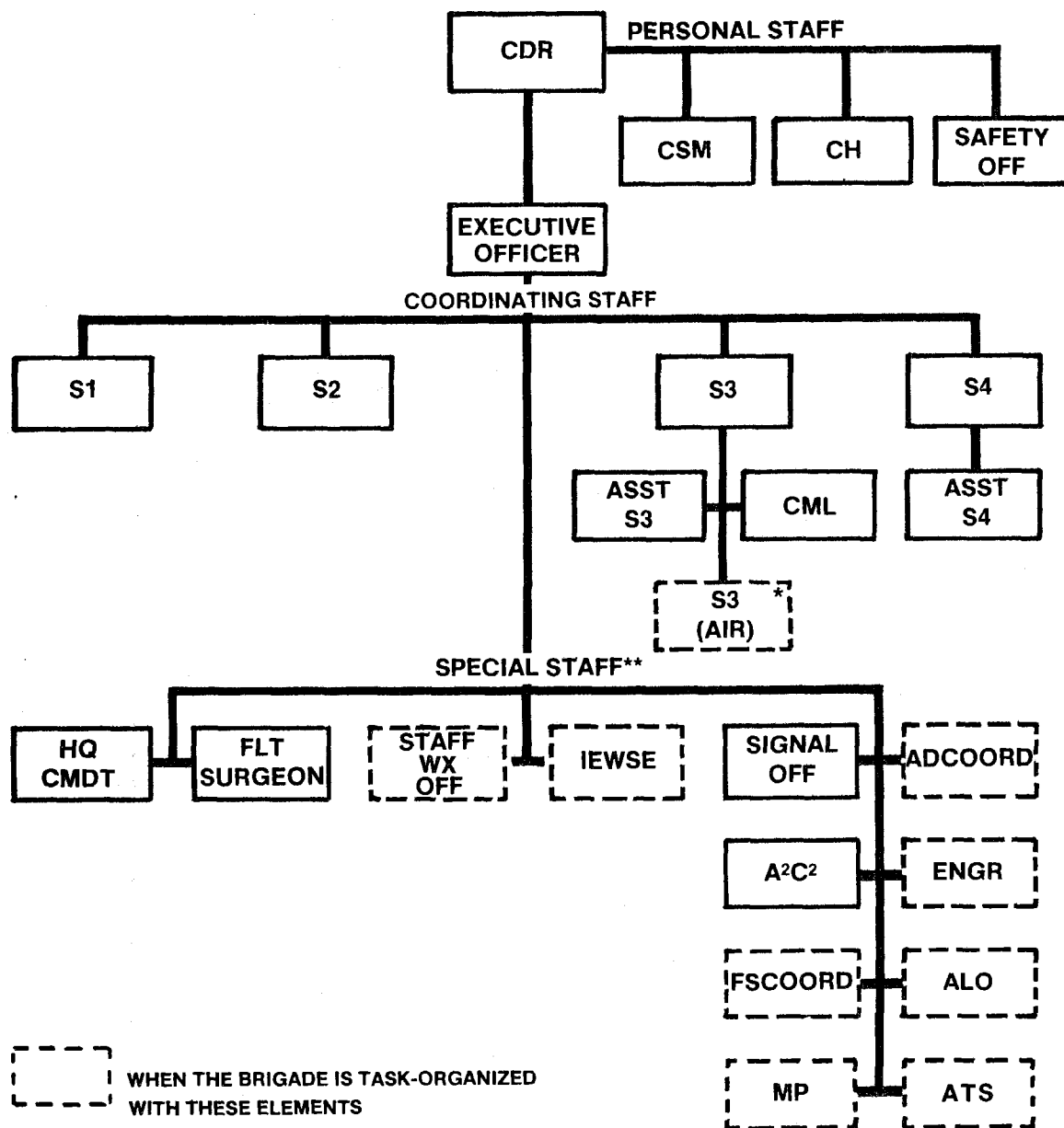
2-1. COMMAND AND CONTROL PROCESS

a. Command and control is the process through which the activities of military forces are directed, coordinated, and controlled to accomplish the mission. This process encompasses the personnel, equipment, communications, facilities, and procedures required to gather and analyze information, to plan operations, to issue instructions, and to supervise the execution of operations. The commander and his staff use the C² process to develop estimates and concepts and to execute the mission. Well-understood and well-executed SOPs ensure that the process is orderly.

b. The C² process is a cycle that begins and ends with the commander. It is supported by his staff and subordinate commanders and their relationships with higher and lower echelons of command. Constant streamlining eliminates inefficient or time-consuming procedures. Major functions of this process include making decisions, formulating estimates, developing concepts, and applying troop-leading procedures according to FM 101-5. As a correlation to the C² process, a command and control cycle may be applied to acquire and assess pertinent information such as the factors of METT-T. Thus a course of action can be determined; plans are then directed through the execution.

2-2. COMMAND AND CONTROL ORGANIZATION

The C² organization is used by the commander in structuring his staff to meet mission requirements. It defines the relationship and authority of each staff section and establishes the functional grouping of the sections. Figure 2-1 shows a sample aviation brigade staff structure, which consists of personal, coordinating, and special staffs. The functions of these personnel are discussed below as they pertain to the aviation brigade staff.



*When the S3 (Air) position is not authorized by TOE, the assistant S3 performs S3 (Air) duties.

**Special staff sections are grouped under the coordinating staff section responsible for primary staff coordination.

Figure 2-1. Typical aviation brigade staff structure

a. Aviation Brigade Commander. The responsibility for command, control, and coordination of the aviation brigade begins with the force commander; he alone is responsible for the outcome of his force's combat actions on the battlefield. The variety and impact of tasks confronting the aviation brigade commander are unique. Although he commands a brigade-level organization, his focus of employment is often at division level and higher. These tasks require the cooperation of many people, the integration of complex equipment systems, and the sensible division of work. The brigade commander is responsible for command and control of organic, assigned, or attached aviation and nonaviation forces; he also has to integrate the critical support provided by other friendly elements. The commander exercises command and control over maneuver, CS, and CSS elements that are assigned, attached, or under the OPCON of his unit. His main concerns are to accomplish the mission and to ensure the welfare of his soldiers. The successful commander will delegate authority and foster an organizational climate of mutual trust, cooperation, and teamwork.

(1) The aviation brigade commander is the key leader at the tactical level. He is the force behind the tactical planning for this brigade; he analyzes and defines the mission and directs its execution. He issues mission-oriented orders. These orders are detailed only to the extent necessary for coordination within a broad scope. The commander acknowledges the professional competence and expertise of his subordinate commanders; they have extensive latitude within his intent in how they execute their missions.

(2) All plans and orders are in concert with the senior commander's intent. Staffs and subordinates must understand this intent. Thus they can act appropriately when communications fail or local situations change. The commander controls the ongoing battle; he also provides guidance for planning future operations. He must position himself where he can best influence operations of subordinate units and maintain critical communications with higher, lower, and adjacent units. The brigade commander is normally located in the main CP. When the tactical CP is employed, he is located with the tactical CP and essential staff elements.

(3) The aviation brigade's forces influence the spectrum of deep, close, and rear operations; therefore, the commander must see the battlefield from the same perspective as the higher commander. His tactical decisions must constantly be aimed at synchronizing his combat efforts with those of other force assets. The commander must know the enemy as well as he knows his own forces. His guidance should reflect the products of a detailed mission analysis and a thorough IPB.

(4) The brigade commander cannot win the battle alone; he must rely on his staff and subordinate commanders. They advise and assist him in planning and supervising operations. He has to understand their capabilities and limitations. The commander must train them to execute his operational concepts in his absence. He institutes cross-training among the staff; thus the unit can still operate when combat losses occur. He is also responsible for safety during all conditions--peacetime or actual combat. The commander develops and directs a brigade safety program. He is assisted by his safety officer and subordinate commanders and staffs.

b. Executive Officer. The executive officer is the principal assistant to the commander and is second in command. He must be prepared to assume command in the absence of the commander at any time. In this capacity, the executive officer represents the commander and directs actions according to his policies.

(1) As staff coordinator and supervisor, the executive officer is responsible for the execution of staff tasks and the coordinated efforts of staff members. He ensures that the staff performs as a team. He assigns definite responsibilities and transmits the commander's decisions to the staff and to subordinate commanders, when applicable, in the name of the commander. Staff members can still deal directly with the commander. However, a staff officer is obligated to inform the executive officer of instructions or requirements received from the commander. The executive officer establishes liaison and liaison activities. In addition, he is responsible for the information program. He also serves as the materiel readiness officer. The executive officer's duties are based on the desires of the commander.

(2) During combat operations, the executive officer is normally positioned in the brigade main CP. He marshals CS for the commander's plan and ensures that CSS is continuous. He visits the brigade rear CP often to determine the status of CSS operations. The executive officer must remain current on the tactical situation and be prepared to assume command on a moment's notice. His commander must train him and allow him to assume command during training exercises so that he will be prepared to assume command in combat.

(3) The executive officer formulates and announces staff operating policies. He also ensures that the commander and staff are informed on matters affecting the command. Finally, the executive officer supervises the main CP and its operations.

c. Brigade Staff. The brigade staff consists of the officers and enlisted personnel who plan and supervise brigade tactical operations. The brigade staff synchronizes CS and CSS operations. Thus support is integrated according to the brigade commander's concept. Except in scope, the duties and responsibilities of the brigade staff are similar to those of higher-echelon staff.

(1) The responsibilities of key personnel must be defined carefully by the SOP to preclude overlaps and to ensure that all functions are supervised. Key personnel must be positioned on the battlefield where they can best carry out their duties.

(2) The staff reduces the demands on the commander's time in various ways. It obtains and provides information, anticipates the situation, and makes recommendations. It also prepares plans and orders, supervises the execution of orders, and coordinates the operations.

(3) The staff members supply the aviation brigade commander with an accurate picture of the area of operations. Delays in receiving or disseminating critical information affect the entire operation. The staff must identify key indicators and demand quick and accurate reports from subordinate headquarters. SOPs streamline this process by showing standard briefing formats and by identifying individuals in the chain who pass the information. The staff must restrict requests for information to those people or agencies needed to accomplish the mission. Any report or information that is not critical to a tactical decision or does not alter priorities should be eliminated.

(4) Although the staff estimate may be informal at this level, it must address battlefield activity, project courses of action, and predict results. Careful IPB, selection of the most important enemy indicators, and development of contingency plans facilitate the estimates and allow for timely response. The key person in this process is the executive officer; he ensures that the staff maintains a forward-looking perspective.

(5) For the aviation brigade to deal successfully with the C³ challenge, the commander must not be burdened with detailed, structured staff briefings. The executive officer must control the staff. He must ensure that discussions with the commander are open and frank and that they address only the most critical agenda items.

d. Personal Staff. Personal staff officers work under the immediate control of the commander. They assist him directly instead of working through the chief of staff or the executive officer. They may perform some of their duties as personal staff officers and the remainder of their duties as special staff officers or members of a coordinating staff section. Members of the personal staff include those personnel authorized by the TOE and TDA as personal assistants to the commander, personnel the commander desires to supervise directly, and those personnel who by regulation have a special relationship to the commander.

(1) Command sergeant major. The brigade CSM advises the brigade commander on matters concerning the soldiers of the brigade. He is not an administrator; however, he must understand the administrative, logistical, and operational requirements of the brigade. The CSM will focus on any function critical to the success of the operation. AR 600-20 and FM 101-5 describe the specific duties of the CSM.

(2) Chaplain. The brigade chaplain organizes and provides religious support activities, education programs, and training for the brigade. The chaplain will--

- Serve the HHC and provide pastoral ministry for unit personnel and collocated elements that do not have an assigned chaplain.
- Minister to wounded, hospitalized, and confined personnel.
- Provide pastoral counseling to members of the command.

- Advise the commander and staff on religious matters and morals and morale affected by religion.
- Assist the commander by monitoring the leadership practices of the command to ensure that they meet the highest moral, ethical, and humanitarian standards.
- Supervise subordinate battalion chaplains.

(3) Safety officer. The safety officer advises the brigade commander on both aviation and ground safety matters. The safety officer will--

- Develop and implement the brigade aviation and ground safety programs.
- Continuously monitor all brigade operations and evaluate them as they affect the overall safety program.
- Advise planners of critical safety issues associated with planned missions.
- Monitor and advise subordinate unit safety officers as required.

e. Coordinating Staff. Coordinating staff officers are the commander's principal staff assistants. They are directly responsible to the executive officer; however, the commander often consults them directly. These staff officers inform the executive officer of such exchanges with the commander. Each is concerned with one or a combination of the broad fields of interest. They assist the commander by coordinating the plans, activities, and operations of the command.

(1) Coordinating staff officers collectively assist the commander in executing his responsibilities; the exceptions are those functional areas that the commander controls personally or that are reserved by regulation for specific staff officers. Each coordinating staff officer ensures that activities of special staff officers falling within his field of interest and responsibility are coordinated and integrated with operations.

(2) Coordinating staff officers often have a direct interest in areas that are the responsibility of another staff officer. For example, training is a primary staff responsibility of the operations officer; however, the intelligence officer and the logistics officer are directly concerned with training within their respective fields of interest. In such instances, staff responsibilities must be clearly defined to ensure coordination and to eliminate conflict. The executive officer, following the commander's guidance, assigns definite responsibilities to each staff officer concerned; he assigns primary responsibility to a single coordinating staff officer.

(a) Personnel officer (S1). The S1 normally operates from the brigade rear CP and is collocated with the S4. He is responsible to the brigade commander for unit strength, personnel management, morale, discipline, and law and order. The S1 and S4 must cross-train so that they can conduct continuous operations. The S1 performs personnel functions outlined in FM 101-5 and TC 12-17. Although the S1 and S4 are normally located in the brigade rear CP, they continuously maintain liaison with the TOC. If assets are available, an S1/S4 representative is collocated at the main CP to effect continuous liaison and coordination for current and future operations. This collocation will ease coordination of personnel and logistics requirements or effects of personnel and logistics on operational requirements. Normally, the senior in rank of the S1 and S4 officers is responsible for the brigade rear CP and the disposition, status, and operations of all aviation brigade units in the rear area.

(b) Intelligence officer (S2). The S2 normally remains at the TOC. There he has communications assets so that he can--

- Coordinate surveillance and reconnaissance activities.
- Update the intelligence estimate.
- Maintain the enemy situation map.
- Provide current weather data.
- Evaluate and interpret enemy information.

The S2 monitors and contributes to the overall reconnaissance and surveillance effort. He also supervises the activities of attached intelligence assets. The S2 is responsible for the functions described in FMs 34-1, 34-3, 34-60, 34-80, 34-130, and 101-5. An aviation brigade S2 may have to prepare, continuously update, and disseminate a "hazards to flight" map and provide in-flight intelligence.

(c) Operations officer (S3). The S3 is the commander's principal assistant for planning and coordinating brigade operations. He monitors the battle, coordinates to ensure that essential CS and CSS assets are provided when and where required, and anticipates developing situations. The assistant S3, the S3 (Air), and chemical and signal officers normally work directly for the S3. The S3, assistant S3, and S3 (Air) must always be abreast of the situation. They must be responsive to directives from higher headquarters; they must also be aware of the needs of subordinate commanders and supporting organizations. The S3 normally is in the command group. He often positions himself in the TOC unless the tactical CP is employed. If aviation brigade activities are oriented in several directions, the S3 may be best suited at the TOC or he may assume individual control of part of the battlefield as directed by the commander. The S3 must coordinate

continuously with other staff elements. FM 101-5 covers the responsibilities of the S3 in more detail. However, an aviation brigade S3 has unique responsibilities. He will--

- Routinely plan and coordinate combined arms, joint, and combined operations across the depth and width of the battlefield simultaneously.
- Direct A²C² functions for the aviation brigade.
- Develop and coordinate the brigade's aircrew training program in lieu of an aviation brigade standardization officer.
- Monitor and advise subordinate unit standardization officers so that they maintain a high level of readiness in aviation training.
- Advise the brigade commander on the training posture of the brigade's aviation training program and on standardization.

(d) Assistant S3. The assistant S3 is normally responsible for operations in the absence of the S3. The assistant S3 performs those tasks identified under the responsibilities of the S3.

(e) S3 (Air). The S3 (Air) is the principal advisor in coordinating joint air support operations for the aviation brigade. He may also serve as the S3 (Plans) officer. Working directly for the S3, the S3 (Air) will--

- Assist the S3 in preparing aviation portions of estimates, plans, orders, and reports.
- Forward preplanned requests for tactical air support, such as CAS and JAAT missions, to higher headquarters and immediate requests to the TACP, TAC(A), or corps ALO.
- Assist the TACP (if available to the brigade) regarding orientation, security, and logistics.
- Supervise the brigade A²C² element.

(f) Chemical officer. The chemical officer normally works under the direct supervision of the S3. The chemical officer will--

- Advise the commander on offensive and defensive NBC operations.
- Coordinate with the S2 on developing the NBC IPB.
- Assist in planning the use of nuclear and chemical weapons.
- Prepare NBC estimates, plans, and SOPs.
- Receive, collate, evaluate, prepare, and distribute NBC reports.

- Recommend MOPP levels based on MOPP analysis.
- Plan and coordinate NBC reconnaissance operations.
- Plan, coordinate, and supervise air and ground decontamination operations and chemical monitoring and radiological surveys.
- Maintain the radiation exposure status of subordinate and attached units.
- Advise the commander regarding smoke and flame operations.
- Conduct a nuclear and chemical vulnerability analysis.
- Coordinate with the S4 on logistics requirements for NBC equipment.
- Exercise staff supervision over NBC training throughout the command.
- Participate as a member of the brigade's A²C² element.

(g) Logistics officer (S4). The S4 must understand the commander's intent and initiate timely actions to support that intent. The S4 usually collocates with the S1 in the brigade rear CP. The S4 monitors the tactical situation closely to begin resupply quickly. He designates two or three people from the section to help him operate the administrative and logistics center. He also provides the commander with information on all logistical matters. The S4 coordinates with subordinate S4s on the status of equipment and supplies and the ability of brigade rear operations to support their needs. He also coordinates the brigade rear elements, supports their missions, and directs their disposition on the battlefield. The S4, with the S1, operates the administrative and logistics communication net. The S4 will perform those logistics functions described in FM 101-5. In lieu of an aviation brigade maintenance officer, the S4 advises the brigade commander regarding aviation and ground maintenance and aircraft availability. The S4 will--

- Continuously monitor each subordinate unit's maintenance program and aircraft availability.
- Assist units with coordination of external support.
- Advise the commander on the maintenance posture of subordinate units.
- Establish priorities for aviation and ground maintenance.

(h) Assistant S4. In the absence of the S4, the assistant S4 assumes the responsibility for brigade logistics and performs those duties as directed by the S4. The duties may include sustainment and logistics operations or specific logistics functions such as Class III and V or maintenance.

f. Special Staff. Special staff officers assist the commander in professional, technical, and other functional areas. At brigade level, special staff officers are found either organic to the HHC or attached to those units that support the brigade. Special staff officers who normally advise the brigade commander during combat operations are listed below along with a discussion of their functions.

(1) A²C² personnel. The brigade's internal A²C² element is formed with the S3 (Air), ALO, FSO, AD LO, ATS officer (if available), and chemical officer. Appendix H of this manual, FM 1-103, and FM 100-103 further address A²C².

(2) Signal officer. The signal officer normally is a signal corps major who works directly for the S3. The signal officer will--

- Advise the commander on all signal matters including the location of the headquarters and signal facilities and the use of signal activities for deception.
- Supervise signal activities of subordinate units.
- Plan operations for installation operation and maintenance of signal communication systems by assigned or attached units.
- Coordinate measures to reduce electromagnetic radiation interference.
- Coordinate the preparation and distribution of the automated signal operation instructions for the command.
- Prepare the signal annex to SOPs, operation orders, and plans.
- Supervise the activities of the brigade communications platoon.

(3) Headquarters commandant. The HQ commandant is commander of the brigade HHC. He answers directly to the brigade executive officer. The HQ commandant is responsible for the training of assigned personnel; the maintenance of organic equipment; and the support, security, and movement of the brigade TOC and tactical CP and supporting elements according to the unit SOP.

(4) Fire support coordinator. When fire support assets are provided, the commander of the direct support unit usually serves as the brigade FSCOORD. He is the brigade commander's primary fire support advisor. Because of his duties, this artillery commander cannot always be at the brigade headquarters. Therefore, he provides a full-time fire support element. The FSE usually consists of an FSO, a fire support sergeant, and two fire support specialists. The FSO will--

- Keep higher and subordinate FSEs informed of the supported force's situation.

- Exchange battlefield information--to include the positioning of FA-- with the supported force.
- Establish, operate, and displace the FSE.
- Recommend coordinating measures for force fire support.
- Supervise the target acquisition effort of the FSE.
- Prepare and disseminate fire support documents, records, and reports.
- Advise the supported commander and other fire support representatives on enemy and friendly fire support.
- Integrate fire support in battle plans.
- Coordinate survey operations for maneuver forces so that a common grid location is rapidly established.
- Prepare and execute the force's fire support plan.
- Monitor and initiate requests for fire support and analyze targets for attack by fire support.
- Make recommendations concerning fire support.
- Participate as a member of the A²C² element.
- Supervise, train, and evaluate his FSE and subordinate FSEs, as appropriate.
- Analyze targets to determine which munitions to use.
- Ensure that communications for the FSE are adequate.
- Prepare and execute nuclear and chemical fire support plans.

(5) Brigade engineer. When engineers are placed in DS of the aviation brigade, the brigade receives an engineer liaison element. Normally, this element consists of a brigade engineer officer, an operations NCO, a combat construction foreman, and a vehicle driver. The brigade engineer will--

- Prepare the obstacle and barrier plan.
- Provide engineer expertise for planning.
- Develop an estimate of critical engineer work load.
- Request augmentation assets from the corps engineer.
- Coordinate engineer support for maneuver task forces.

- Serve as the engineer task force commander when two or more engineer companies operate in the brigade section.

(6) Staff weather officer. The theater, corps, or division staff weather officer provides a direct support team to the aviation brigade. The weather team consists of an Air Force SWO, weather forecasters, and observers. This team furnishes direct weather forecasts to the brigade. The team supports the brigade S2 for the IPB and conducts weather briefings for aircrew mission planning.

(7) Flight surgeon. The flight surgeon advises and assists the commander so that he can conserve the fighting strength of the command to include preventive, curative, and restorative care and related services. The surgeon is normally located at the brigade clearing station within the brigade support area. He will also--

- Advise the commander on health services of the command and of the occupied or friendly territory within the commander's area of responsibility.
- Advise the commander on the medical effects of the environment and of NBC weapons on personnel, rations, and water.
- Determine requirements for the requisition, procurement, storage, maintenance, distribution, management, and documentation of medical, dental, optical, and veterinary equipment and supplies.
- Plan and coordinate medical training in the command.
- Supervise activities of subordinate battalion surgeons, if assigned.

(8) Air liaison officer. The ALO is an Air Force officer who is a member of the TACP. The TACP usually consists of two ALOs--one major and one captain--and three tactical aircraft C² specialists--one technical sergeant and two sergeants. They operate from vehicles equipped with organic FM, HF, UHF, and VHF radio systems. In the absence of an assigned TACP, the S3 (Air) performs the duties of the ALO. The ALO will--

- Advise the commander and staff on the employment of tactical air support including CAS, battlefield air interdiction, SEAD, reconnaissance, and airlift.
- Operate on the USAF air request net.
- Transmit immediate requests for CAS and reconnaissance support from the brigade headquarters.
- Coordinate tactical air support requests and missions with staff elements.

- Supervise the TACP.
- Participate as a member of the A²C² element.

(9) Military police platoon leader. The MP platoon leader acts as staff adviser on MP maneuver, CS, and CSS operations. He directs the actions of the MP platoon when it furnishes DS to the brigade. The MP platoon leader will--

- Supervise battlefield circulation control operations including route reconnaissance and surveillance, MSR regulation enforcement, refugee and straggler control, and information dissemination.
- Plan area security operations that will protect personnel, materiel, and facilities from enemy rear attacks.
- Monitor enemy prisoner of war operations to ensure the humane treatment, accountability, evacuation, and internment of EPWs and civilian internees.
- Supervise law-and-order operations.
- Prepare the MP portion of estimates, plans, orders, and reports.

(10) Air defense coordination team. The AD coordination team is the single point of contact for air defense for the brigade commander. It is normally composed of one officer and four enlisted personnel deployed in a combat vehicle. The AD coordination team will--

- Provide expertise on AD employment and tactics.
- Advise on active and passive AD measures.
- Give guidance on using non-AD weapons for air defense.
- Prepare the AD portion of estimates, plans, orders, and reports.
- Provide information regarding AD unit dispositions and missions, the weapons control status, and early warning of Threat air attack.
- Function as part of the A²C² element.

(11) IEW support officer. The IEW support officer is the chief of the intelligence and IEW support element provided to the brigade from the military intelligence battalion. The IEW support element performs liaison between the brigade and the MI battalion. The IEW support officer--

- Advises the brigade S2 and S3 on the capabilities, limitations, and employment of MI assets.
- Assists the brigade S2 in planning the use of MI assets and in preparing mission requirements.

- Coordinates with the supporting MI elements or the IEW company team commander to ensure rapid responses to requirements.
- Ensures rapid dissemination of combat information from MI elements directly to the brigade S2.
- Ensures that deployed DS MI elements are advised of friendly force maneuvers that directly affect their security.

(12) Air traffic services representative. Normally, the ATS representative is the ATS platoon leader or a designated NCO. The representative is responsible for liaison between the aviation brigade and ATS assets. He must inform the aviation brigade commander of assets available, their capabilities and limitations, and the optimum employment of ATS elements. The ATS representative also coordinates with other A²C² elements of the brigade staff and ATS assets.

2-3. COMMAND AND CONTROL FACILITIES

The aviation brigade commander organizes his staff sections so that they can acquire and analyze critical information and determine and direct actions required for command and control. He also organizes his command and control facilities to enhance C². The primary command and control facilities are the command posts--main, tactical, and rear--and an alternate TOC. Other command and control facilities may include FARPs, assembly areas, and support areas.

a. Command Posts. Command posts throughout the brigade serve the C² needs of the commander and staff in deep, close, and rear operations. The dynamics of the battlefield require the highest level of organizational and operational efficiency within CPs at all levels of command. Automated and manual information systems minimize the time required for administrative processing of information. They accurately depict the tactical situation, preclude data from having to be verified, and make information immediately available to the commander and staff members.

(1) CPs and their supporting automation and communication systems are high-priority targets. They present radio-frequency, thermal, acoustic, visual, and moving-target signatures that are fairly easy to detect. They will be disrupted by electronic means, if not destroyed, unless measures are taken to make them less vulnerable. These measures should include--

- Maintaining local security.
- Locating on reverse slopes to deny enemy direct and indirect fire effects.
- Locating in urban areas to harden and reduce infrared or visual signatures.
- Remotely locating and dispersing antennas.

- Dispersing CP subelements.
- Displacing often.

(2) In most cases, survivability requires that techniques be combined. These measures must also be balanced against retaining effectiveness. Frequent displacement might reduce the vulnerability of a CP; however, such movement may then greatly degrade its C² functions. A displacing CP also becomes more easily detected by moving-target indicator radar.

(3) The brigade commander organizes his headquarters and staff to control, sustain, and support his forces. Normally, the aviation brigade will have a main CP and a rear CP. A tactical CP will be established, when required, to control a key operation. Thus the brigade can operate efficiently. Also, this organization lessens the difficulty of establishing and maintaining more than two echelons at any one time. The brigade main CP will be positioned to command, control, and communicate with its forces. The aviation brigade commander may position his command and control facilities like those in Figure 2-2. The network will be modified to meet the situation. Brigade units under the control of other headquarters will position their elements to provide C² and to allow sustainment and communications. Figures 2-3 and 2-4 reflect typical dispositions of a corps aviation brigade and an EAC aviation brigade.

b. Main Command Post.

(1) The main CP coordinates, directs, and controls current operations and tactical planning for future operations. It collects and disseminates reports and produces plans and orders and intelligence products. The main CP consists of the TOC, logistics support elements, maintenance facilities, and associated CS assets such as communications facilities. An example of a main CP configuration is at Figure 2-5.

(2) Most of the brigade staff operate from the main CP. The staff includes the S2, S3, FSO, and ALO or their representatives; TACP, if attached; and personnel of the signal platoon. Other representatives can be included such as engineer, AD, or intelligence personnel and the USAF weather team.

(3) Personnel in the main CP operate from the TOC and monitor operations on a 24-hour basis. They maintain communications with their subordinate, higher, and adjacent units. They also maintain maps and records and receive and disseminate reports as required. TOC personnel are continuously planning ahead and providing information and assistance to the commander and his subordinate commanders. They must be responsive to requests and have a sense of urgency at all times.

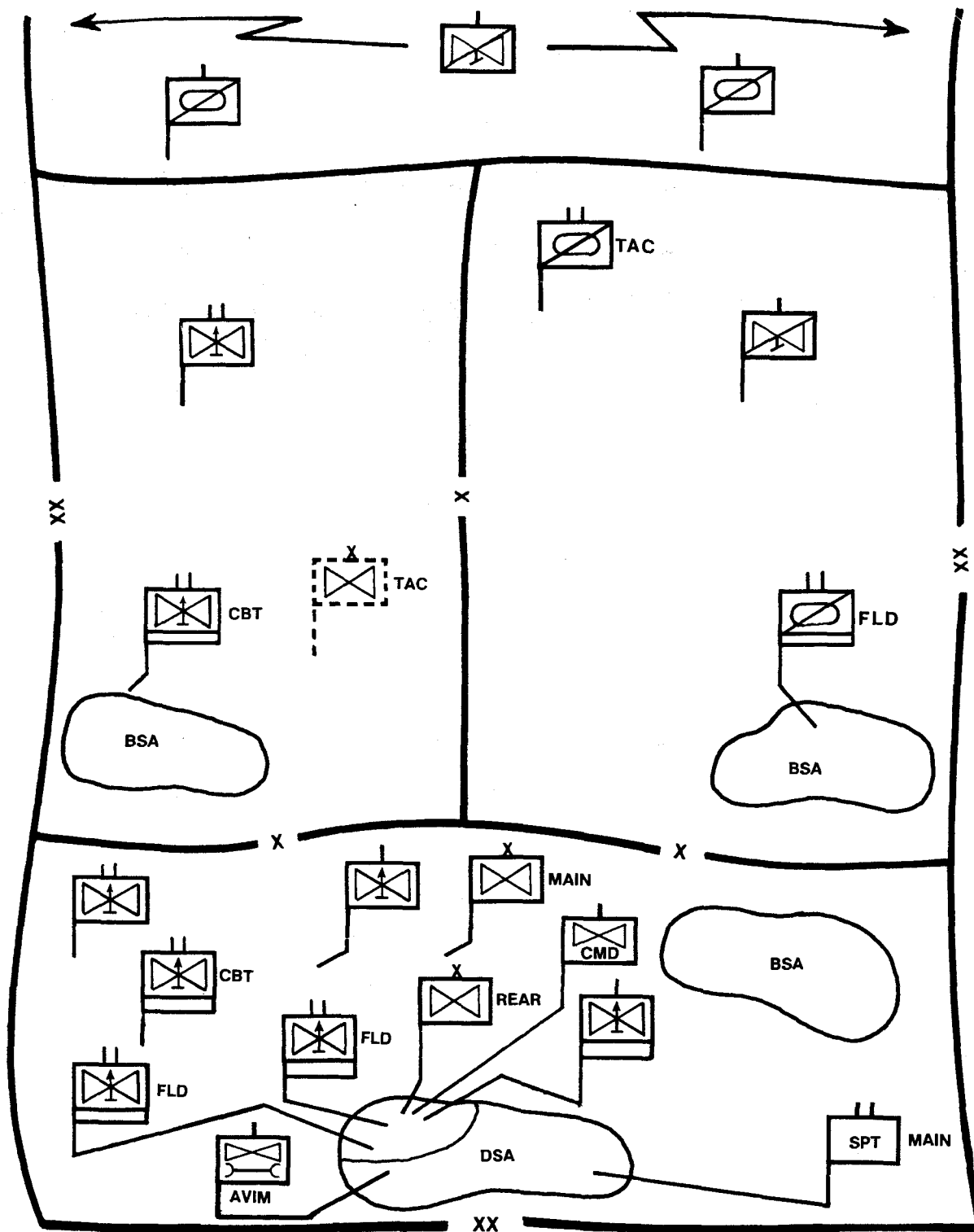


Figure 2-2. Typical disposition of a division aviation brigade and support assets (AVIM and MSB)

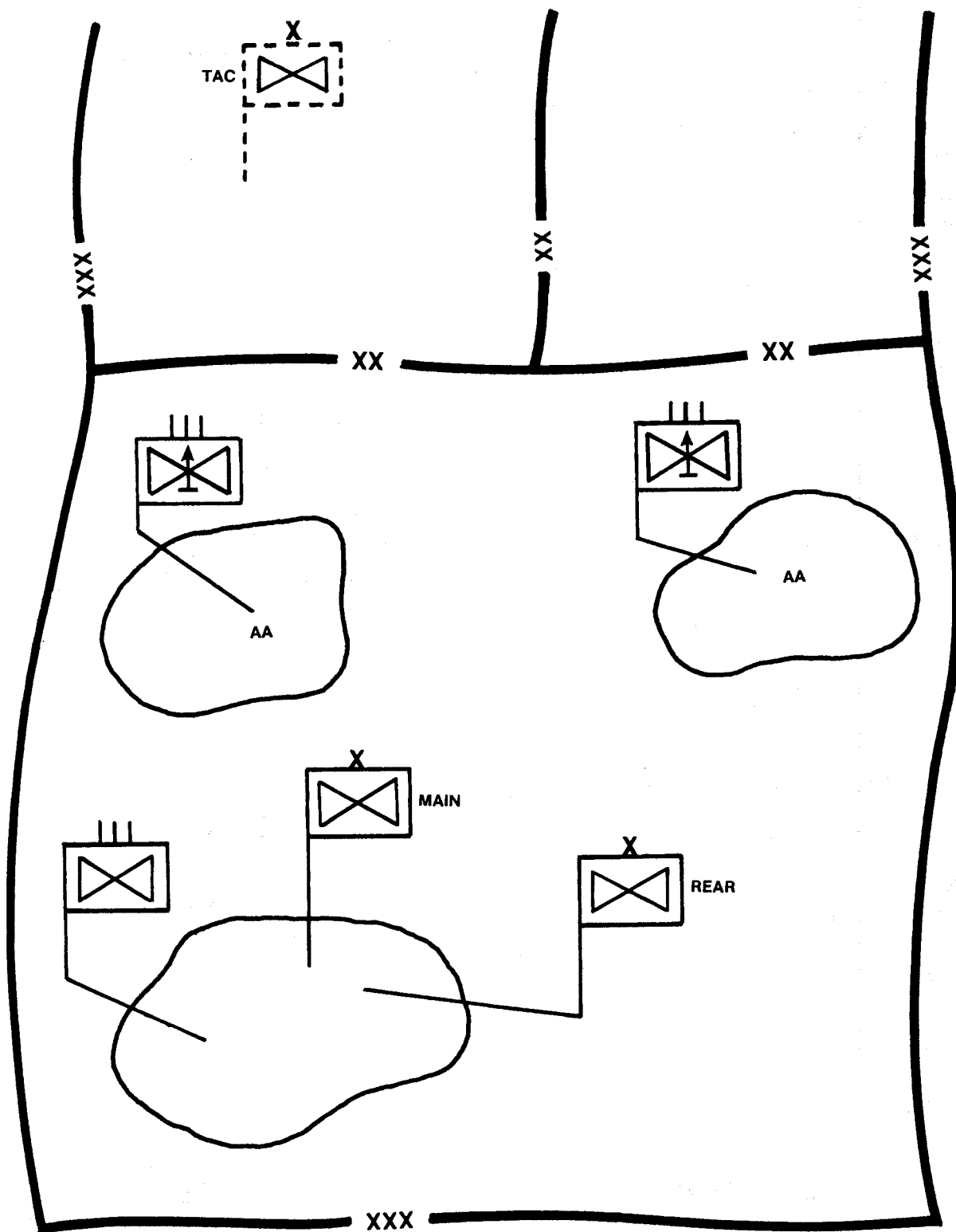


Figure 2-3. Typical disposition of a corps aviation brigade

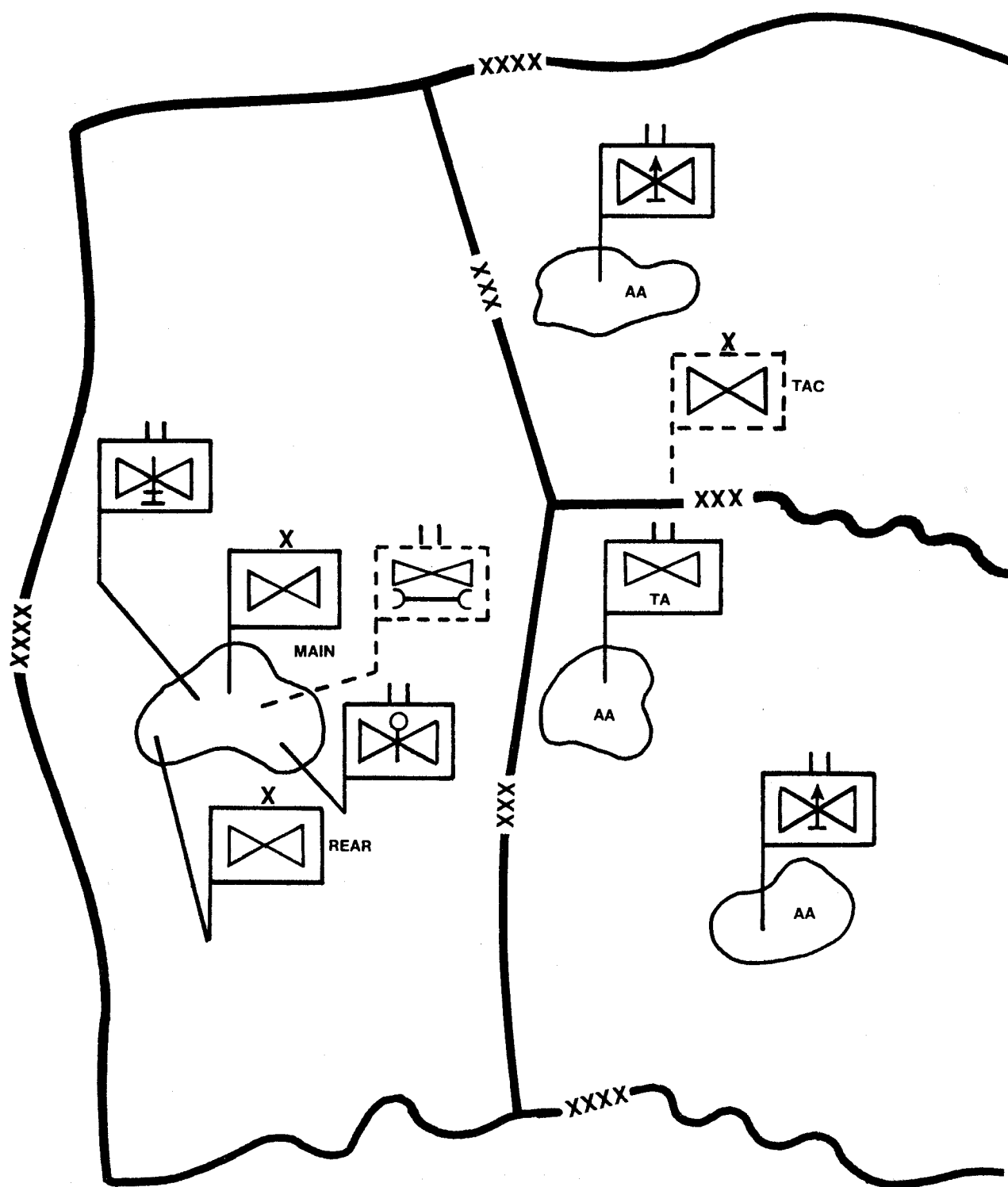


Figure 2-4. Typical disposition of an EAC aviation brigade

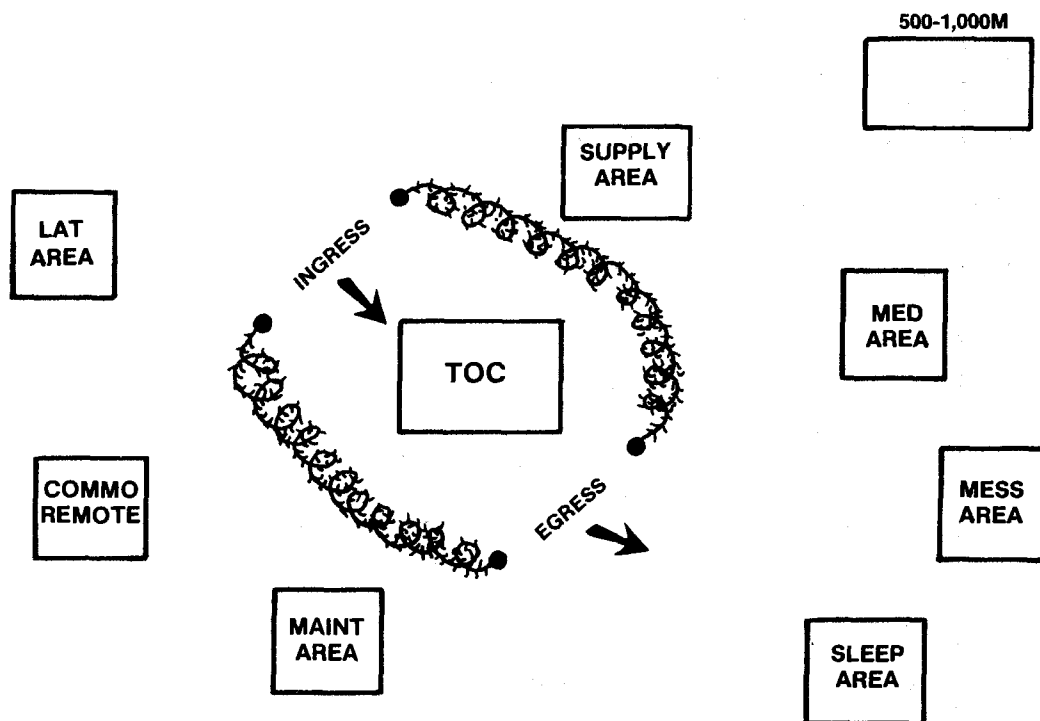


Figure 2-5. Example of a main CP

(4) The TOC must be prepared to assume total control of the current operation during the displacement of the tactical CP. Among other functions, TOC personnel--

- Validate and evaluate combat intelligence of immediate interest to the commander.
- Control maneuver, CS, and CSS forces.
- Control all immediate fire support to include tactical air support.
- Coordinate airspace command and control and AD operations.
- Receive, evaluate, and process tactical information from subordinate units and higher headquarters.
- Relay instructions to subordinate units.
- Coordinate maneuver, CS, and CSS requirements.
- Coordinate terrain management for all aviation brigade command and control facilities.

- Keep abreast of CS and CSS capabilities and status.
- Submit reports to higher headquarters.
- Graphically depict friendly and enemy situations.
- Make a continuous estimate of the situation.
- Make recommendations to the commander.
- Prepare and issue FRAGOs, OPORDs, OPLANs, INTSUMs, INTREPs, and SITREPs.
- Maintain communications.

(5) Several factors involving both friendly and enemy forces have immediate operational impact. Those that must be monitored by the TOC and communicated to the commander are listed below.

(a) Friendly factors include the--

- Changes in the mission or status of the battalion/separate company or higher, subordinate, and adjacent units.
- Changes in the status of supporting fires or tactical air priority.
- Loss of unit combat effectiveness of a company-size or larger force, including DS or attached units--maneuver, CS, or CSS.
- Strength, location, and activity of operational forces down to battalion and separate company level including DS and attached units--maneuver, CS, and CSS.
- Status of major organic items significantly affecting combat power.
- Class III and V status of adjacent and subordinate units.
- Status of friendly or enemy obstacles and contaminated areas.
- Employment of smoke by friendly forces.
- Employment of NBC weapons by friendly forces.

(b) Enemy factors include--

- Contact with or withdrawal of company-size or larger units.
- Changes in the location or sighting of company-size or larger units.
- Employment of NBC weapons.

- Employment of smoke by Threat forces.
- Appearance of nuclear fire support weapons.
- Knowledge of the current location of all air defenses.
- Location, strength, identification, and activity of units in contact and capability of enemy units to reinforce and support.
- Significant changes in enemy logistical capabilities.

(6) Operational functions of the TOC should be standardized in the SOP; all personnel should be familiar with them. Functions include methods of--

- Maintaining maps and graphics.
- Passing messages.
- Receiving and rendering reports.
- Servicing generators.
- Erecting extensions and camouflage nets.

All of the areas in the TOC should be arranged in a similar manner. This similarity helps when moving about the area during darkness. Some information must be common knowledge. Such information includes generator service schedules, the order of march for movement, who performs security functions, or what is required when the TOC shelter is erected or wire is laid.

(7) The brigade TOC has no fixed organization. The S3 organizes his section to meet the requirements of the situation. In a tactical situation, S2 and S3 activities intermingle. Therefore, the S3, coordinating with the S2, organizes the S2-S3 operations portion of the main CP. This S2-S3 operation is continuous, provides a capability for displacement, and--when required--operates a jump, or temporary, TOC. However, the tactical operations center should be standardized as described for the tactical CP. Figure 2-6 shows an example of a TOC based on the M934 expandovan.

(8) Considerations for the location of the TOC are discussed below.

(a) The S3 selects the general location of the TOC based on METT-T. The most important consideration for selecting a TOC site is good communications with higher, subordinate, and adjacent headquarters. Accessibility to road networks, cover, concealment, and drainage are other considerations. The S3, coordinating with the HHC commandant and signal officer, normally selects the TOC location. Several alternate TOC sites should be selected and, when possible, reconnoitered.

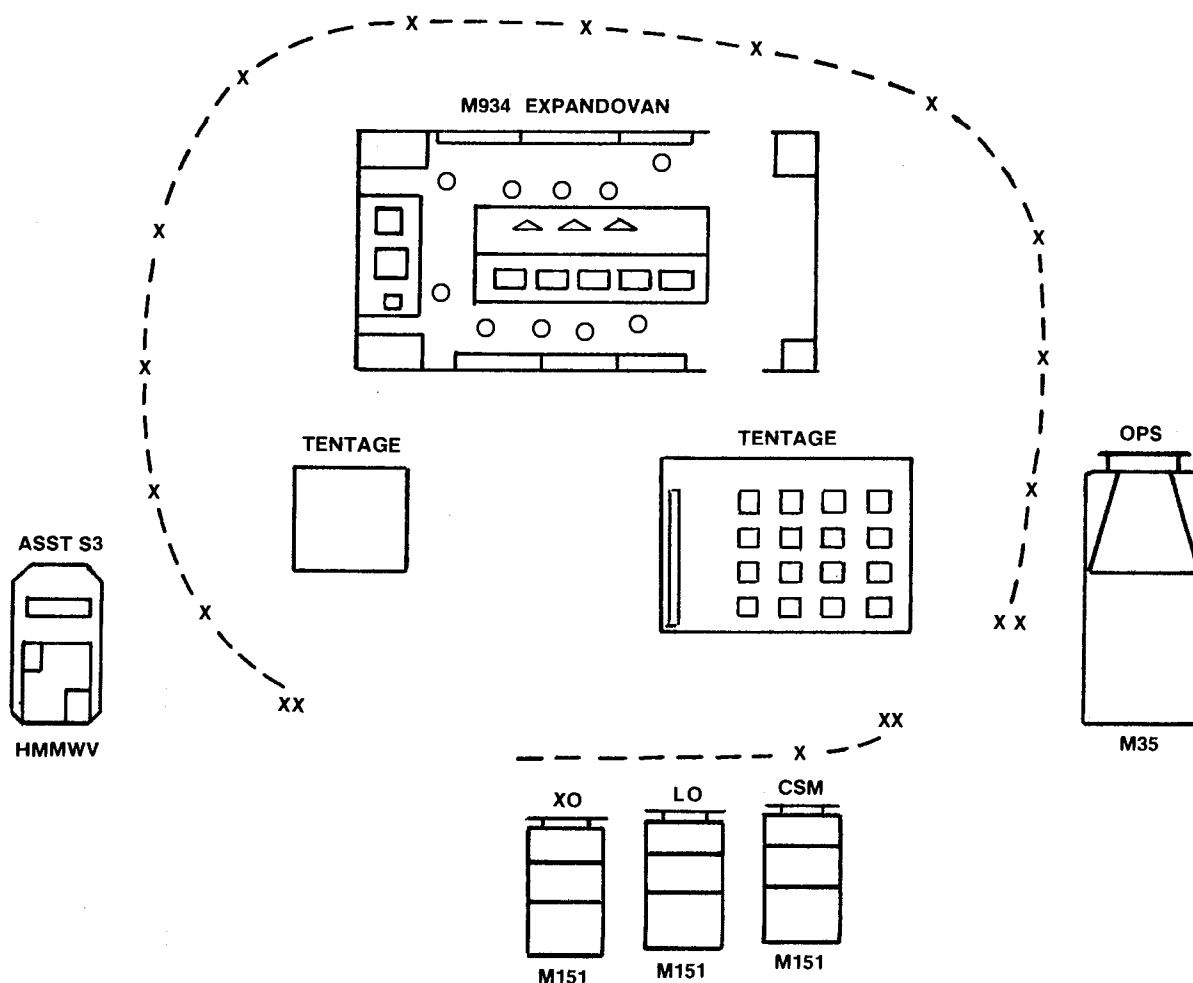


Figure 2-6. Example of a TOC based on the M934 expandovan

(b) During offensive operations, the TOC should be well forward. In fast-moving operations, the TOC may have to operate on the move. Staff coordination and communications are degraded when the TOC is moving; thus both the TOC and the units it controls must train to operate in this mode.

(c) During defend and delay operations, the TOC should be located farther to the rear to minimize its vulnerability. The exact location will depend on the terrain, the road network, and the ability to communicate.

(d) When possible, the TOC should be located in built-up areas. Barns, garages, and warehouses minimize the need for detailed camouflage; basements offer protection from enemy fires. Covering windows and operating in basements enhance noise and light discipline. Built-up areas also reduce infrared and electromagnetic signatures; therefore, the TOC does not have to move as often.

(e) When built-up areas cannot be used, the TOC should be located on reverse slopes of terrain features. This terrain provides cover and concealment from both ground and air observation and fires. The ground must be firm enough to support vehicle traffic, provide adequate drainage, and allow space for vehicle dispersement.

(f) The TOC should be located near routes with relatively easy access to the area as well as to higher and subordinate headquarters and rear areas. Prominent terrain features or major road junctions should be avoided; thus the enemy cannot easily determine the TOC location.

(g) When required to move with tactical operations, the TOC may displace as a whole or by echelon. The method selected depends on METT-T, the distance to be moved, and communications requirements. Movement somewhat degrades the capability of the TOC; however, the brigade and subordinate command nets are to be maintained. All movement plans are designed with this requirement in mind.

(h) Before the TOC displaces, the brigade S3 establishes the general area for the new TOC. The HHC commandant, executive officer, and S3 or assistant S3--along with the signal officer--conduct detailed reconnaissance. An NBC reconnaissance team also normally accompanies the advance party. The party identifies possible routes and sites with cover and concealment. These locations must provide effective FM communications and accommodate all vehicles and equipment. Terrain profiles must be made so that multichannel communications function with the existing area communications centers. Several possible sites must be identified, reconnoitered, and planned to provide flexibility during combat operations.

(i) Once a specific site has been chosen, the multichannel communications team of the supporting signal unit displaces and establishes multichannel communications at the new site. The team is accompanied by a brigade communications platoon wire team. Sketch maps are made; these show the exact element siting within the new CP location. The TOC places a net call to inform subordinate headquarters of the impending move and to shift reporting and coordinating functions to the tactical CP during the displacement. Breakdown and march orders of TOC elements then take effect as prescribed in the SOP. A displacement team--which consists of the brigade executive officer, signal officer, assistant S3, and selected section guides--departs for the new site to finalize occupation plans and to aid in the reception of the TOC main body as the advance party. The main CP normally displaces in two echelons. The TOC, accompanied by support elements led by the HHC commandant, has priority on routes. When the HHC commandant and the TOC elements occupy the new location, the main CP support element--led by the command sergeant major--displaces. During displacement, TOC elements should continue to monitor the battle and update situation maps and information displays. These tasks reduce the time required to become operational again.

(j) A TOC is a major source of electromagnetic and infrared energy. If the TOC is not moved often, the enemy can fix its location and place indirect fire or close air support on it. The larger and more elaborate the establishment, the less rapidly the TOC will be able to move. The

TOC should travel light and move often. However, over time, too frequent movement hinders TOC operations.

(k) The brigade TOC will be one of the most lucrative targets for the enemy. The first line of security for the TOC is to prevent the compromise of its location through OPSEC and communications security measures.

(l) The HHC commandant is responsible for the defense of the TOC. He should first establish a perimeter defense around the TOC at a distance of about 50 to 100 meters. On order, the perimeter would then be occupied by TOC and support personnel. The perimeter includes fighting positions, obstacles, and protective wire barriers. During operations, the sleep area should be organized so that personnel sleep near their positions on the perimeter.

(m) Because of the TOC's austere personnel structure, its security is achieved mainly through passive measures. Passive measures include proper cover and concealment and adherence to OPSEC measures. Active measures include having selected HHC and attached personnel available to secure primary entrances and exits and to conduct surveillance of likely avenues of approach. Other measures include activating reaction forces upon an identified incursion. Reaction plans are rehearsed and executed upon a predetermined alarm and rally point from which these reaction forces may be directed to counter the Threat. All personnel should also be given a detailed briefing of their security duties. A high degree of security must be maintained, even during displacement, and security measures refined afterward. The TOC security element generally--

- Establishes initial security.
- Positions crew-served weapons and vehicles.
- Positions remaining personnel.
- Clears fields of fire.
- Establishes a wire communication system as well as communications with higher, adjacent, and subordinate units.
- Emplaces obstacles.
- Prepares fighting positions.
- Prepares alternate and supplementary positions.
- Selects and prepares routes for supply and evacuation.

(n) Units normally conduct daily stand-to at BMNT minus 30 minutes or just before an operation. They maintain stand-to for 45 minutes. The purpose of stand-to is to establish and maintain a combat-ready posture for combat operations. Stand-to includes all steps and measures necessary to ensure maximum effectiveness of personnel, weapons, vehicles, aircraft,

communications, and NBC equipment. Units will assume a posture during stand-to that enables them to commence combat operations on short notice. However, aviation unit operations may dictate that stand-to functions not be performed as described; however, security cannot be neglected.

(o) In defending the TOC, all personnel must know the locations of their positions. They must ensure that the positions are well prepared and are mutually supporting. The alarm to occupy fighting positions should be identified and announced. Occupation of these positions should be practiced at least once after personnel occupy a TOC site and practiced routinely according to the unit SOP.

c. Tactical Command Post.

(1) The commander and the S3 or the assistant S3 normally establish the tactical CP. This CP is temporary and staffed with the minimum personnel necessary to conduct tactical planning procedures. The brigade tactical CP is the forward echelon of the brigade headquarters.

(2) If the tactical CP is located close to the battle, the commander can establish face-to-face contact with subordinate, adjacent, and higher commanders. The tactical CP is limited in size, manning, and electronic and visual signature. It can be displaced rapidly and often, depending on METT-T. A tactical CP should normally be smaller than a battalion TOC.

(3) The commander conducts the current operation from the tactical CP, assisted by a small staff, which provides combat-critical information only. The tactical CP staff also--

- Controls maneuver, CS, and CSS forces.
- Acquires, develops, and disseminates combat intelligence of immediate interest to the commander.
- Provides priorities and planning guidance for CS and CSS to the brigade executive officer, located in the TOC.
- Provides routine reports and limited planning when the TOC is being displaced.
- Maintains communications with higher headquarters and supported ground units.
- Issues mission changes--OPORDs or FRAGOs.

(4) The tactical CP must be staffed to operate continuously. According to METT-T, the commander designates personnel to operate the tactical CP. These personnel may include the commander, S3, assistant S3, FSO (or representative), S2 (or representative), and ALO. The tactical CP is tailored to the situation; it is configured based on available vehicles, aircraft, and other assets. The S3 is responsible for staff coordination and functioning of the tactical CP.

(5) Support for the tactical CP is provided by the brigade HHC commandant. He normally makes two trips to the tactical CP daily (possibly coinciding with delivery of hot breakfast and supper meals) to bring water, fuel, maintenance support, and supplies.

(6) Because of the frequency and rapidity of displacement required, the primary means of communication used at the tactical CP is FM-secure. Communications from the tactical CP normally will be FM or AM radio or both and may include multichannel facilities. Operational radio nets are--

- The higher-echelon command net.
- The brigade command net.
- The higher-echelon operations and intelligence net.
- The brigade operations and intelligence net.
- The USAF coordination nets--FM, HF, UHF, and VHF.

(7) Proper radio and telephone procedures must be strictly enforced so that important, time-sensitive information can reach the brigade commander. Normally, only commanders, executive officers, and S3s communicate on the command net. All routine reports are sent through the operations and intelligence net. The tactical CP must be sited to ensure continuous communications with the higher-echelon tactical CP, brigade main CP, and subordinate or supporting TOCs.

(8) When the commander and the S3 are away from the tactical CP, the tactical CP staff monitors the current operation. Tactical CP personnel update all maps and reports. When the command group returns, it can then receive an accurate portrayal of the brigade situation. Tactical CPs are especially useful during operations such as deep attacks or passage of lines.

(9) The brigade tactical CP normally deploys with aircraft provided by the command aviation battalion or company or by vehicles supporting the main CP. When possible, the tactical CP will be located within a built-up area so that it can--

- Reduce infrared and visual signatures.
- Harden the CP location.
- Provide hasty living accommodations for assigned personnel.
- Provide work space for tactical activities.

A built-up area requires less organic equipment and fewer personnel. It also allows tactical CPs to be more rapidly displaced. When deployed in a field site, a tactical CP requires more concealment such as the use of camouflage nets. Tactical CPs are normally austere. They are established based on

METT-T and assigned equipment. Standardized formats and procedures for tactical CP establishment expedite the C³ of the brigade.

(10) Displacement of CPs must be planned to ensure continuous information flow and command and control of brigade operations. Having a tactical CP and a TOC enables the brigade to displace CPs and to maintain control of the current operation. How often CPs and associated elements are displaced depends mostly on the enemy's ability to locate and attack CPs by fire or EW and on the need to maintain communications.

(11) Because of its proximity to the FLOT and its electronic signature, the tactical CP must move often. Control is usually passed to the main CP during the move; however, the tactical CP should be able to operate on the move. The tactical CP may displace when the command group is deployed forward. During defensive operations, the commander can take key staff assistants with him in ground or air transport and move to the main CP to control the battle until the tactical CP is ready to resume control.

d. TOC Operations. An efficient TOC operation is developed only by a well-trained staff and commander. Extensive training in simulated field environments will create the technical expertise and staff cohesion that will enable the brigade to operate effectively on today's dynamic battlefield. The organization and function of command posts have two key dimensions. First is the internal flow of information and staff coordination; thus the commander will receive timely information and recommendations. Second is the external flow of information and command decisions among the command posts at all levels. Information and command decisions must be passed at once to CPs within the command as well as to higher and adjacent commands.

(1) Continuous operations. FM 22-9 contains a detailed discussion on continuous operations.

(a) Human fatigue probably degrades performance the most. Performance and efficiency begin to deteriorate after 14 to 18 hours of continuous work; they reach a low point after 22 to 24 hours. Performance improves somewhat during the next 8 to 10 hours. Then it begins to decrease again. For most tasks involving perceptual skills, an individual's performance is degraded after 36 to 48 hours. Effectiveness ceases after 72 hours of continuous duty. An NBC environment also degrades performance. Appendix E and paragraph (2) below further describe this information.

(b) The commander must be able to recognize the signs of sleep loss or performance degradation. Noticeable effects are--

- Depression.
- Irritability.
- Errors of omission.
- Lapses of attention.

- Erratic performance.
- Slower reaction time.
- Short-term memory impairment.
- Impairment in learning speed.
- Increased time to perform a known task.

(c) Periodic breaks and mild exercise can counter the effects of sleep loss for staff personnel. Among combat crews, commanders may rotate tasks if the crews are cross-trained. However, varying tasks through job rotation works only if the jobs include tasks with different requirements such as gunner to loader or driver.

(d) Schedules enhance personnel performance by allowing breaks for rest. The example of a TOC schedule at Figure 2-7 is simple. It represents one method that may be used. Personnel become accustomed to working with one another. When this shift schedule is used, shifts should overlap at least 30 minutes to allow the personnel going off duty to brief the incoming shift personnel. If a unit has a daily staff update meeting scheduled, this meeting may be the best time to change from one shift to another. Thus the new crew can begin its shift fully briefed. At the next change of shift, another briefing is conducted for TOC personnel only. A new shift must always be briefed before its shift begins. This schedule also eases feeding operations because it allows standardized hours to be set.

(2) Performance degradation in an NBC environment. Command and control may suffer greatly in an NBC environment because of leader exhaustion. Leaders must pace themselves, delegate, and observe a strict work-rest regimen. Forced liquid intake--especially under NBC conditions--minimizes dehydration, stress, and poor performance.

(a) Communications will also be degraded in an NBC environment. Radio transmissions will increase and verbal face-to-face communications will become less effective.

(b) NBC conditions may also hinder combat operations. The operational tempo will be greatly decreased. Direct fire and target/objective acquisition and identification may also be hampered. Indirect fire systems not under these conditions will be relied on heavily. Strong leadership is necessary under these conditions, as in other battlefield conditions, to reduce stress and maintain a combat-effective unit.

Schedule¹

	<u>A Shift²</u>	<u>B Shift</u>
OP REP	ASST S3 OP SGT ⁴	S3 AIR ³ ASST OP SGT
INTEL REP	S2 SR INTEL ANALYST	TAC INTEL SGT ⁴ INTEL ANALYST
CML REP	CML OFF	CML NCO
OPS RATELO	RATELO	RATELO
CLERK-TYPIST	CLERK-TYPIST S3	FLT OP SPEC
INTEL RATELO VEHICLE/GEN OP FS REP ⁵	INTEL ANALYST S3 DVR FSO	INTEL ANALYST S2 DVR FS NCO OR SPEC
ENGR REP ⁵	BDE ENGR	OP SGT
AF REP ⁵	ALO	TACCS
AD REP ⁵	AD LO	AD LO SGT
S1/S4 REP ¹		

¹Liaison teams will augment shift personnel as available.

²Assistant S3 is A shift OIC.

³S3 Air is B shift OIC.

⁴Tactical intelligence sergeant is shift TOC NCOIC

⁵When artillery is assigned to the unit, it will have a fire support representative.

Figure 2-7. Example of a TOC schedule

(3) TOC personnel update briefing. Before personnel depart the TOC shift, the new shift must be briefed in detail. The briefing should highlight the current situation, significant events during the past 12-hour shift, and any ongoing issues that must be resolved by the next shift. A possible format for the briefing is shown in Figure 2-8.

(4) Operational techniques. TOC personnel must follow procedures outlined in unit SOPs to streamline operations and to provide continuous information flow. Techniques to fulfill these requirements are outlined below.

(a) Journals. DA Form 1594 (Daily Staff Journal or Duty Officer's Log) is an official chronological record of events about a unit or staff section during a given period. The assembled journals of the staff give a complete picture of the unit's operations. These journals are a permanent record. Normally the S2 and S3 sections operate a combined log. Other staff or special staff elements compile their own journals. Message forms, blank report format sheets, and preformatted orders must be prepared

in duplicate to aid the information process. The flow chart in Figure 2-9 depicts an efficient TOC action chain that ends in a journal entry.

CURRENT OPERATIONS

- **SITUATION.**
 - WEATHER—AREA WEATHER FORCES S2.
 - ENEMY FORCES—ENEMY SITUATION, INTELLIGENCE OVERLAY (S2).
 - FRIENDLY FORCES—OPERATIONS SITUATION MAP (S3).
 - ATTACHMENTS/DETACHMENTS—CURRENT BATTALION/TASK FORCE ORGANIZATION (S3).
- **MISSION—BRIGADE OPORD (S3).**
- **EXECUTION—OPERATIONS SITUATION MAP, CURRENT OPORD (S3).**
 - FIRE SUPPORT—FIRE SUPPORT OVERLAY (FSE).
 - ENGINEER SUPPORT—OBSTACLE OVERLAY (ENGR).
 - AD SUPPORT—AD OVERLAY (AD).
 - TAC AIR SUPPORT—(ALO).
 - MOPP LEVEL AND OPERATIONAL EXPOSURE GUIDANCE.
- **SERVICE SUPPORT—PERSONNEL REPORT, COMBAT STATUS CHART, LOGISTICS, AND MAINTENANCE OVERLAY (S1, S4)**
- **COMMAND AND SIGNAL**
 - COMMAND—OPERATIONS SITUATION MAP (S3).
 - SIGNAL—SIGNAL OPERATION INSTRUCTIONS, COMMUNICATIONS STATUS, CHALLENGE AND PASSWORD (COMM OFFICER).

FUTURE OPERATIONS

- **BRIGADE/BATTALION/TASK FORCE OPLAN/OPORD(S3)**
 - CONTINGENCY MISSIONS (S3).
 - SIGNIFICANT PROBLEMS IN LAST 24 HOURS (ALL).

Figure 2-8. Recommended update briefing format

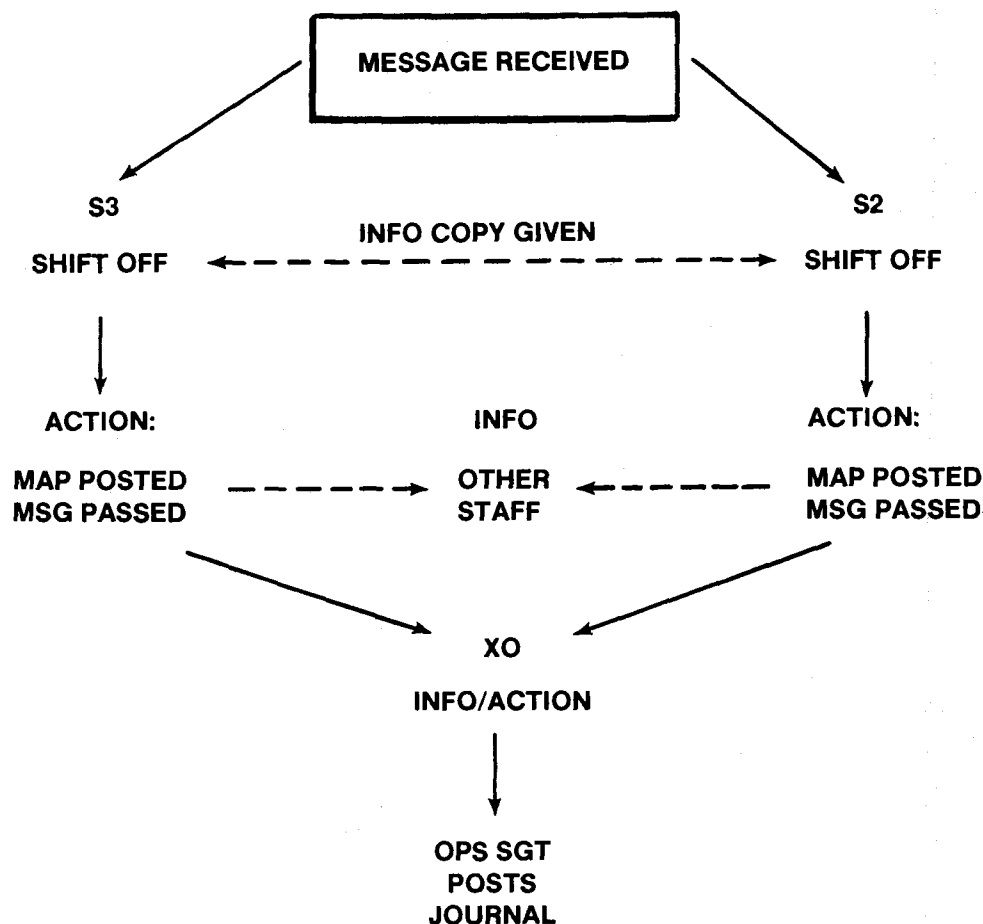


Figure 2-9. TOC action chain

(b) Current operation maps. At the brigade, only key elements of information must be extracted and tracked so that the commander has combat-critical information. The S2 and S3 should use the same current operations map to display an easily understandable portrayal of the flow of battle. All map boards within the TOC should be standardized so that graphic overlays are interoperable. At the brigade, 1:50,000- and 1:250,000-scale maps are normally used. When available, the 1:100,000-scale map offers the aviation brigade adequate detail for analyzing the terrain and for covering the entire area of interest. At least three items of information should be depicted on the current operations situation map. Symbology that portrays the current friendly/enemy situation must include--

- Six-digit locations for subordinate regiments and groups and their subordinate battalion.

- Six-digit locations for corps and division TOCs and TACs.
- Four-digit center-of-mass locations for adjacent friendly units (battalions and larger).
- Six-digit center-of-mass locations for elements in the BSA.
- Six-digit center-of-mass suspected locations for Threat battalions and regiments (date-time group of the report should be centered below the symbol).
- Six-digit center-of-mass suspected locations for the regimental artillery group and division artillery group.
- Symbols that portray boundaries and frontline trace of divisional and subordinate units and suspected Threat boundaries.

Other control measures may be required to command and control the battle. These measures include PLs, contact points, passage points, lanes, routes, assembly areas, and BPs. Figure 2-10 shows an example of a map board design.

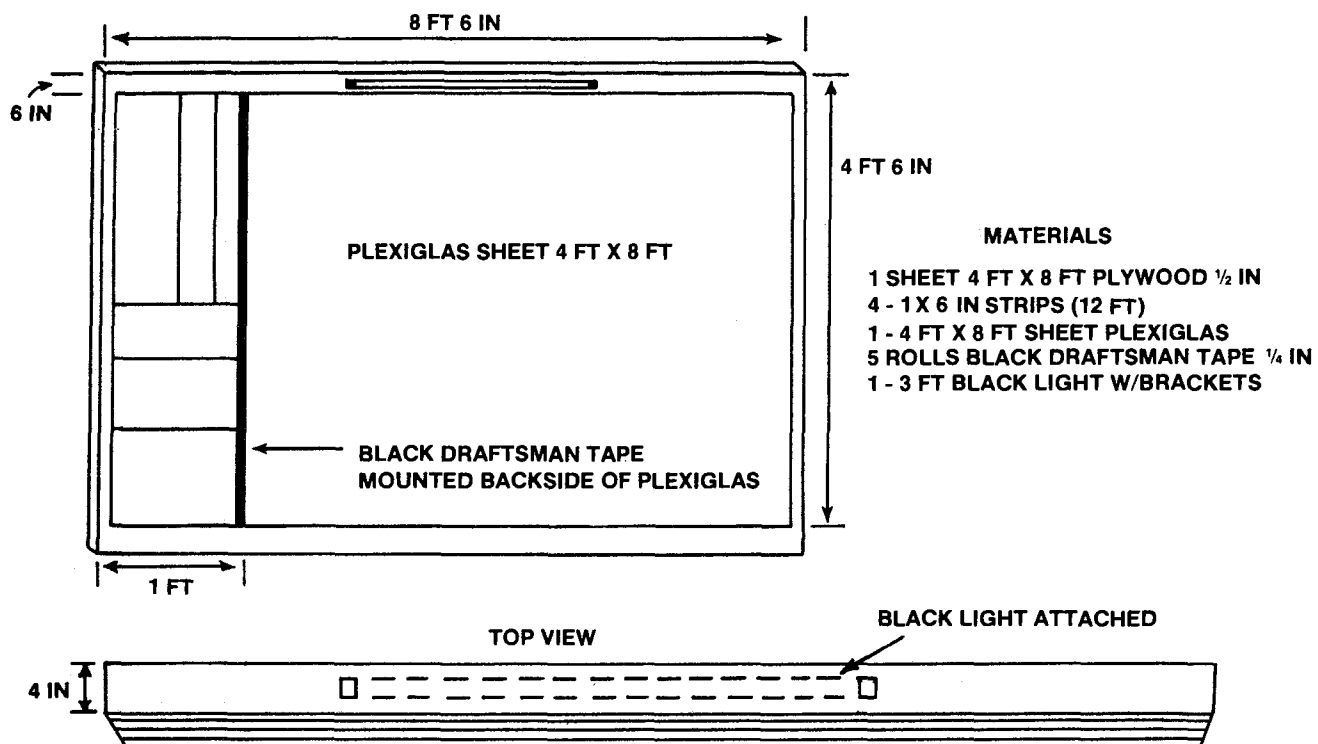


Figure 2-10. Example of a map display

(c) Information display. An information display may be required to supplement details contained on the situation map. This display makes information available that is not suitable for posting on the situation map. Information associated with the situation map is located adjacent to it for easy posting and viewing. Typical information displays are easily updated, readily understandable charts that depict essential information. A display that is not up to date is misleading and useless. Suggested informational displays normally required in a brigade TOC are--

- Task organization.
- Mission and commander's intent (concept of operation).
- Personnel status (includes cumulative aircrew status of subordinate units).
- Logistical status (specific Class III/V status of subordinate units.)
- Combat power.
- Communications status.
- CP locations.
- Tactical intelligence and weather.

Figures 2-11 through 2-16 provide several examples of display and chart formats. These may be used to standardize TOC information displays.

TASK FORCE _____		
ELEMENTS OF CBT POWER IN ARMOR ARTY ATK HEL MTR TAC AIR SHORAD -CHAPARRAL -VULCAN -MANPADS ENGR SCOUTS GS-R C&J CSS	MOPP STATUS 1 DTG _____ 2 3 4 BATTLE RESOURCES STATUS GREEN 80-100% AMBER 60-79% RED 40-59% BLACK 0-39% REMARKS	MISSION: _____ DTG _____ CDR'S INTENT (CONCEPT OF THE OPERATION) _____ TASK ORGANIZATION _____

Figure 2-11. Example of a task-organization display

3 FT

WEATHER FORECAST AS OF _____

24-HOUR FORECAST

SKY CONDITIONS _____

VISIBILITY _____

WEATHER (CURRENT) _____

WINDS /010 /020 /030 /040 /050 /060 /070

TEMP: PA DA ALTSTG

REMARKS: _____

LIGHT DATA:

BMNT _____ Z	SR _____ Z	SS _____ Z	EENT _____ Z
MR _____ Z	MS _____ Z	PHASE _____	ILLUM _____ %

2 FT

Figure 2-16. Example of a weather status display

(d) Administrative requirements. An efficient TOC will have clearly defined administrative procedures in an SOP to speed the information flow and directives to higher and subordinate headquarters. Normally, the operations sergeant is the key individual for these tasks. Enough office supplies must be stocked to allow for extended operations. Basic loads should be established and monitored for all needed supplies. Blank required report formats should be prepared to expedite reporting. TOC personnel must be trained in receiving, consolidating, and transmitting required reports. Drills must be established for reproducing orders in a field environment. Each player in the TOC must know his role. Orders should be handwritten and reproduced rapidly so that planning time for subordinate units is maximized. Organic vehicles, communications, and all auxiliary equipment must be properly maintained and systematically checked to ensure combat readiness. Responsibilities must be fixed and preventive maintenance checks and services conducted routinely.

(5) Eavesdrop system.

(a) The eavesdrop system is used during all tactical operations by all levels from brigade down to the company. This system requires all radio stations to monitor and to send message traffic on a given net, even if they are not the direct recipients of the message. Figures 2-17 through 2-19 depict how the eavesdrop system works within the brigade command, operations and intelligence, and administrative and logistics nets. The procedures within each subordinate unit's net are the same as discussed in the brigade eavesdrop.

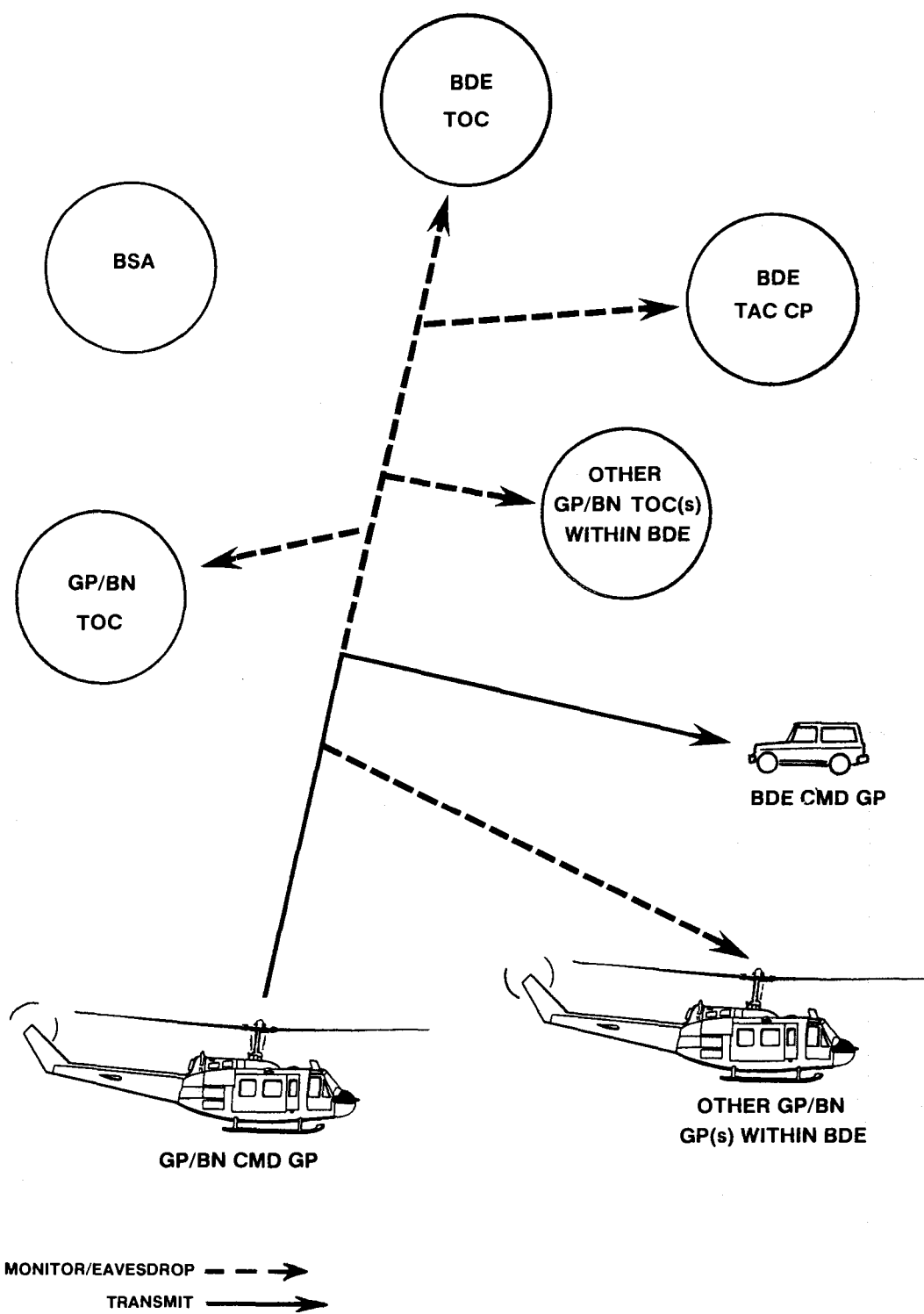


Figure 2-17. Brigade eavesdrop system, command net--lower to higher

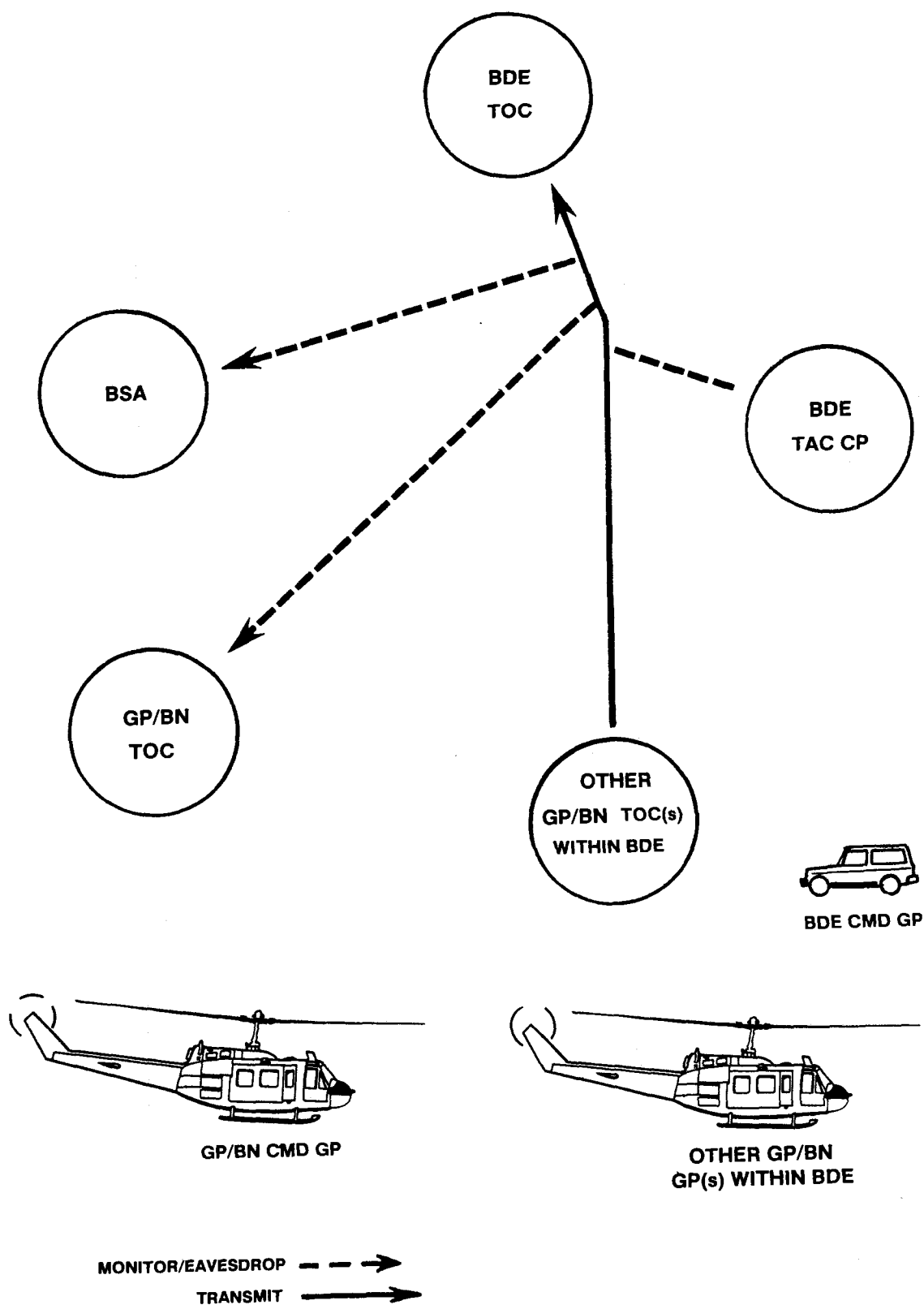


Figure 2-18. Operations and intelligence net--lower to higher

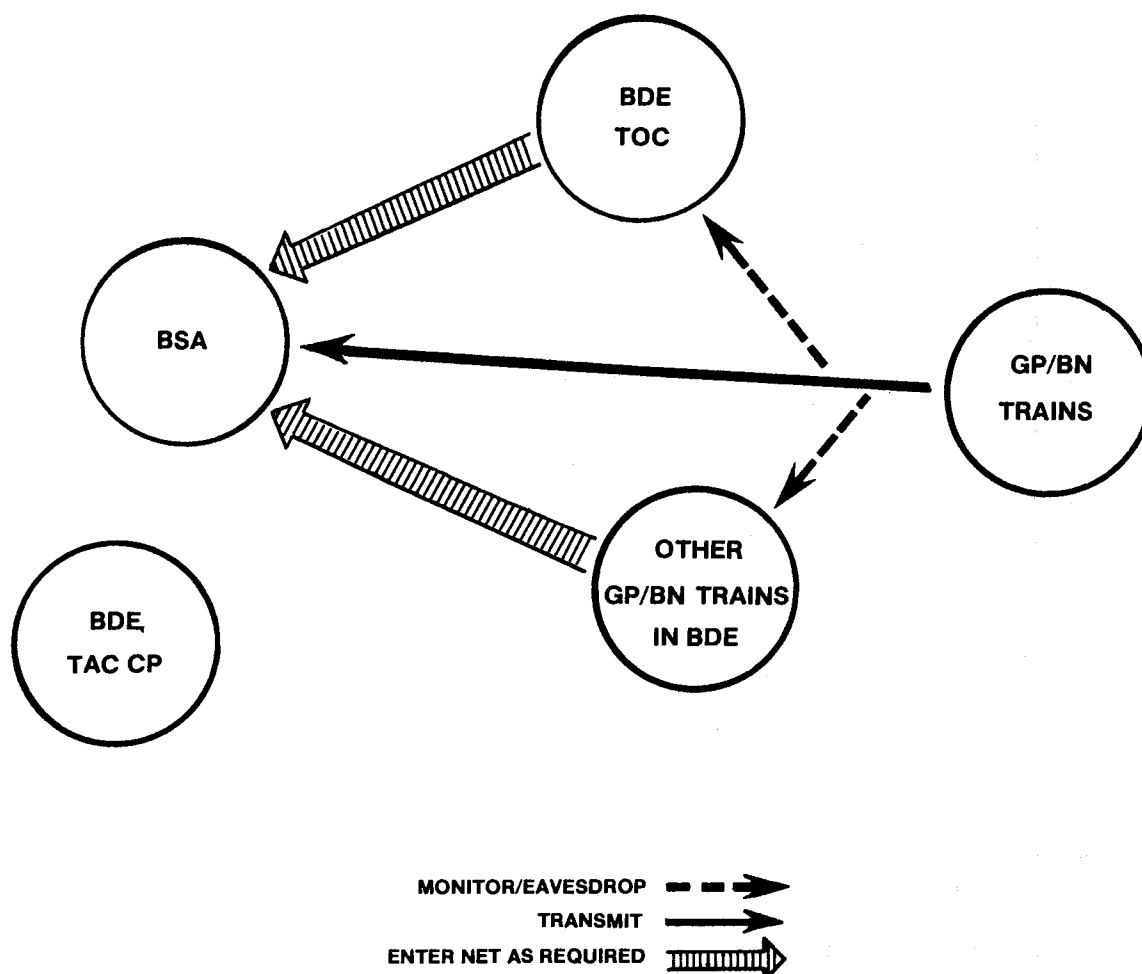


Figure 2-19. Administrative and logistics net--lower to higher

(b) SITREPs or other command net traffic should be sent from subordinate commanders or S3s to the brigade commander or S3 located forward with the command group or in the tactical CP. Command groups of other attached units or units under OPCON and their TOCs also monitor the traffic and update situation maps to understand the intent of operations. Therefore, the amount of radio traffic emanating from TOCs is reduced; thus enemy direction-finding efforts become less successful.

(c) Information passed on the operations and intelligence net is not monitored by the brigade and subordinate commanders. The unit executive officer operating in the TOC must relay the critical information that is passed on the operations and intelligence net to the commander. Also, the S1 and S4 at the brigade rear CP monitor the operations and intelligence net, if possible; or the S1 or S4 representative at the TOC relays this information to the brigade rear CP. Thus the administrative and logistics center can anticipate critical support requirements and problems before subordinate maneuver units can request assistance on the brigade administrative and logistics net.

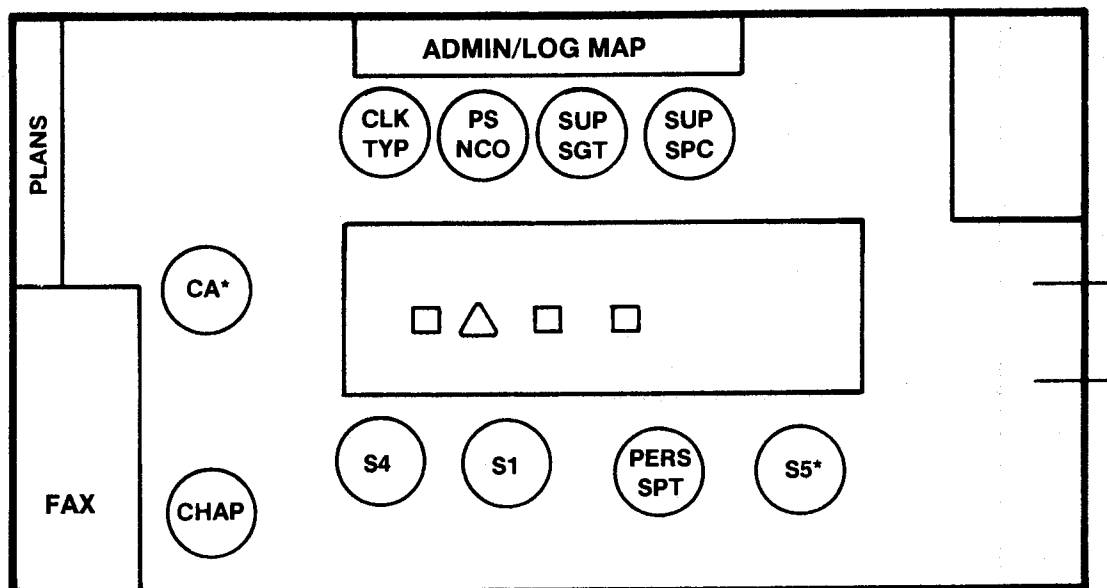
(d) The brigade command group, tactical CP, and TOC must monitor the administrative and logistics net. The S1 and S4 must also keep the executive officer updated on the current and future administrative and logistics situation. This may also be accomplished with S1/S4 liaison personnel.

f. Brigade Rear CP. The brigade rear CP coordinates the CSS required to sustain the brigade. It may be located within the EAC, corps, or division support area or elsewhere in the rear area of the area of operations.

(1) The senior in rank or otherwise designated individual, normally the S4 or S1, is the aviation brigade rear CP commander. The rear CP commander is also responsible for the security of rear area units of the aviation brigade; he ensures that they are integrated into an established base or base-cluster defense for mutual security. The brigade executive officer monitors the operations of the rear area. The S4 and S1 maintain continuous contact with the main CP to coordinate the required support. They also coordinate extensively with higher-echelon support command elements for their respective support functions.

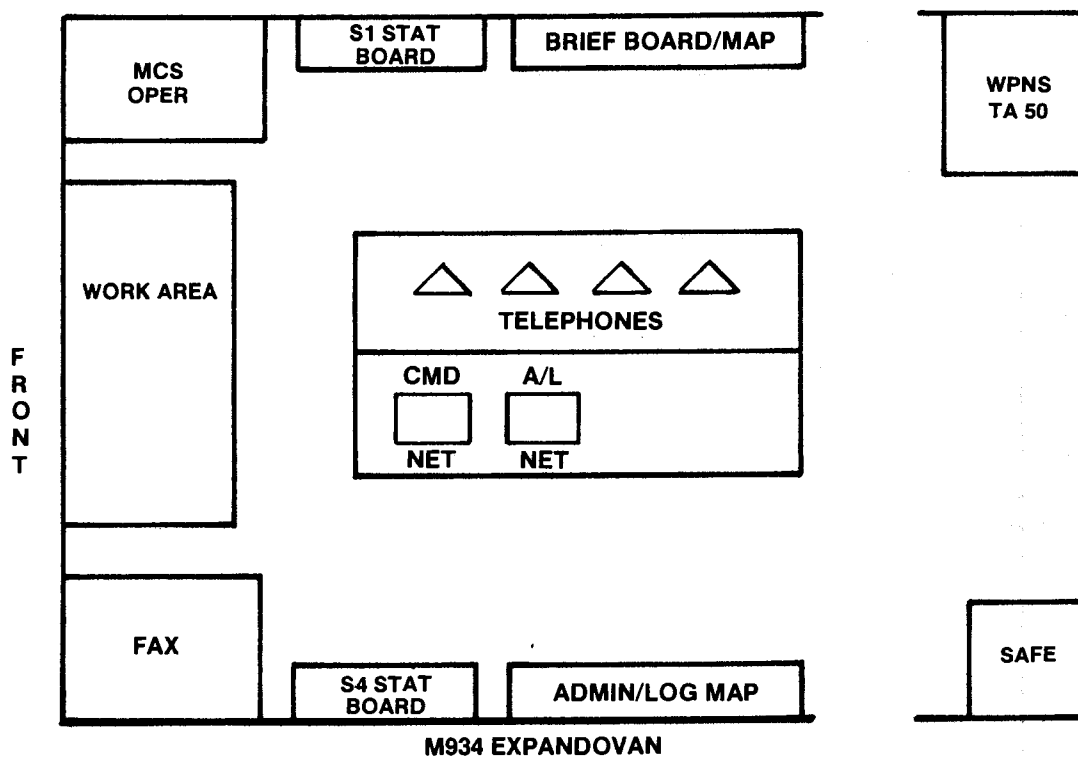
(2) The rear CP also has other responsibilities. These include conducting rear combat operations against Level I and II threats, as described in Chapter 3, and serving as the alternate main CP.

(3) The rear CP is often established in built-up areas, adjacent to the brigade MSR. Continuous communications must be maintained with both brigade and subordinate groups or battalions or a combination of these on multichannel, FM-secure, and RATT nets. For continuous operations, S1 and S4 personnel must be cross-trained in report formats and basic functions. An operations situation map must be maintained in the rear CP for logistics planning and backup tactical C². The chaplain and the flight surgeon are the other key personnel most often located at the rear CP. However, the HHC commandant may often operate between the rear and main CPs, coordinating TOC support, and therefore must operate two communications nets--command and administrative and logistics nets. Figures 2-20 and 2-21 show examples of rear CP formats.



*WHEN AUTHORIZED

Figure 2-20. Example of a rear CP based on two SICPS tents



M934 EXPANDOVAN

Figure 2-21. Example of a rear CP based on the M934 expandovan

g. Alternate TOC. If the TOC is destroyed or otherwise rendered ineffective, the brigade must have an alternate facility to assume its functions. The administrative and logistics center, or rear CP, is normally designated as the alternate TOC. Designation of the alternate TOC should be routinely prebriefed. A subordinate group TOC may also serve as the alternate TOC.

h. Brigade Support Area. When a BSA is established, CSS functions within it are a vital part of combat operations. With only organic assets, however, the aviation brigade may not require a BSA. In this situation, the rear CP may be the only element within the assembly area. However, if subordinate elements of the brigade position their support elements around the rear CP, then the term BSA is appropriate. External support assets under OPCON or supporting the brigade may also be configured around the rear CP. Coordination between the administrative and logistics center and the TOC must be continuous to ensure that CSS is integrated into the overall mission. This coordination is accomplished by--

- Maintaining a radio on the administrative and logistics net with S1 and S4 representatives at the TOC.
- Establishing a landline between the administrative and logistics center and TOC (if possible).
- Maintaining a communication net at the administrative and logistics center on the brigade command net.

Procedures for this coordination must be described in the SOP. Normally, the rear CP commander has staff supervision for the movement and operation of the BSA.

2-4. BRIGADE COMMUNICATIONS

The command transmits and receives information and orders through command communication systems. The commander must understand the capabilities, limitations, and vulnerabilities of his communication systems. Enemy radar, radios, and lasers may operate in the same electromagnetic spectrum as friendly equipment. The commander must expect unintentional interference from friendly units as well as interference from enemy units. Transmissions may also be hindered by terrain, atmospheric conditions, or electromagnetic pulse from nuclear blasts. To compensate for these, the commander should--

- Provide for redundancy in the means of communication.
- Ensure that subordinates understand his intent so that they will know what to do when communications are interrupted.
- Avoid overloading the communication systems by using them only when necessary.

- Use wire or messenger when possible instead of radio.
- Ensure proper signals security practices are followed.

Maintaining communications with higher and subordinate headquarters presents a challenge for the signal officer. Assets available to the brigade are limited, particularly for FM(S) sets. Inevitably, the brigade must rely on a single source to fulfill some communications requirements. The main CP may have to rely more on multichannel and RATT for external nets. In addition to the FM radios on brigade vehicles and aircraft, communications support for the brigade headquarters is provided by two organizations: the signal platoon in the brigade HHC and the supporting signal unit from higher or adjacent headquarters. The signal platoon in the HHC provides FM, AM, RATT, HF, and wire communications. The supporting signal unit provides multichannel and RATT.

a. Communications Responsibilities. All levels of command must gain and maintain communications with the necessary headquarters and personnel. The traditional communications responsibilities of brigades are covered below.

(1) Higher to subordinate. The brigade headquarters must ensure that its radio nets (command, operations and intelligence, administrative and logistics, and fire support) are continually operational. The RETRANS system must be dedicated to on-call restoration of communications on any net. Possible RETRANS locations must be identified and checked before starting operations. All key personnel must understand the operation of the RETRANS system.

(2) Supporting to supported. Liaison elements supporting the brigade must maintain communications between their organization providing the support and the brigade. Thus a continuous operations capability is maintained. Once located at the tactical CP, main CP, or rear CP, these units will be controlled by the brigade staff and the headquarters commandant.

(3) Lateral communications. Responsibility for establishing communications between adjacent units may be fixed by the next higher commander. If responsibility is not fixed by orders, the commander of the unit on the left is responsible for establishing communications with the unit on the right. The commander of a unit positioned behind another unit establishes communications with the forward unit.

(4) Restoration. Regardless of the responsibility, all units act promptly to restore lost communications.

b. Communications With the Combined Arms Team. The aviation brigade must be able to communicate with all members of the combined arms team. The primary means of communicating with helicopters will be FM(S). However, UHF and VHF radios in all helicopters and the HF radio in the OH-58D and C² aircraft will help reduce the load on FM radios. Other available means of communication with other combined arms include wire, messengers, sound and visual, multichannel, and RATT.

c. Radio Communications. Because of the brigade's mobility, the primary means of communication will be radio. However, radio communications are limited by range and line-of-sight restrictions. Unless radio relays are used, commanders may at times lose contact with some forward aviation units. Radio communications should be kept to an absolute minimum until contact is made. Other means to communicate should be used until the radio is necessary so that detection by enemy direction-finding equipment is avoided.

d. Brigade Radio Nets. Figures 2-22 through 2-25 show typical corps aviation brigade radio nets. EAC and division aviation brigade nets, based on the number and types of units assigned in the task organization, are similar to those depicted in these figures.

(1) Command net. A secure command net, controlled by the S3, is used for command and control of the brigade. All assigned units normally operate in this net. As a rule, only commanders, executive officers, or S3s will communicate on the net. Priority-only traffic is passed (Figures 2-22 and 2-23).

(2) Operations and intelligence net. The operations and intelligence net is controlled by the brigade S2. It functions as a surveillance net when required. All routine operations and intelligence reports are sent on this net (Figure 2-24).

(3) Administrative and logistics net. This net is controlled by the S1 and S4. It is used for administrative and logistics traffic within the brigade (Figure 2-25).

(4) Special radio nets. The FSO operates in the supporting FA command fire direction net and in a designated fire direction net to coordinate artillery fires. The USAF ALO, when attached, controls tactical air through a USAF tactical air request net (HF/SSB) and a UHF/AM air-ground net.

(5) Fire control net. The fire control net is an FM net operated by the brigade FSO. Fire control coordination measures and information are passed on the fire control net.

(6) Other radio nets. In addition to the internal nets, the brigade monitors the higher command net (FM and AM), the higher operations and intelligence net (FM and AM RATT), and the higher administrative and logistics net (AM RATT). The FSE monitors the supporting artillery battalion command nets (FM) and fire control net (FM and digital).

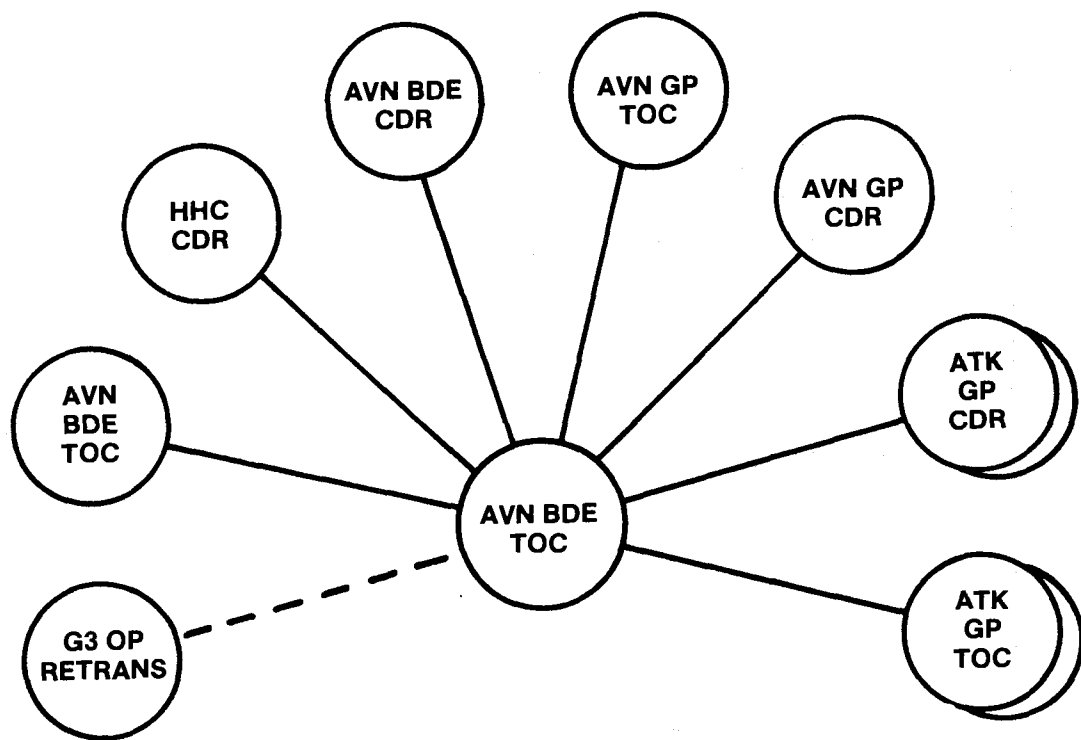


Figure 2-22. Internal command FM net in aviation brigade (corps)

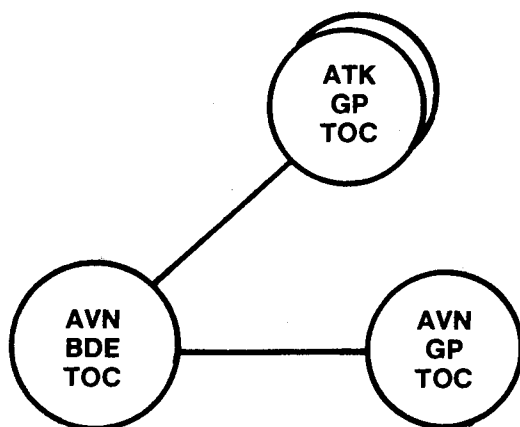


Figure 2-23. Command UHF/AM net in aviation brigade (corps)

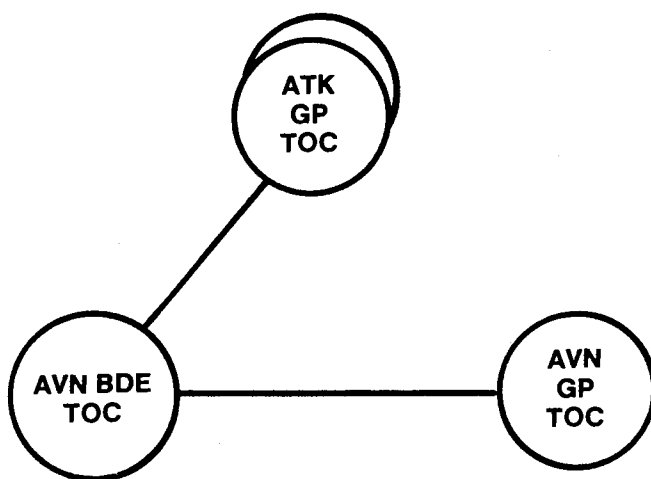


Figure 2-24. Operations and intelligence FM net in aviation brigade (corps)

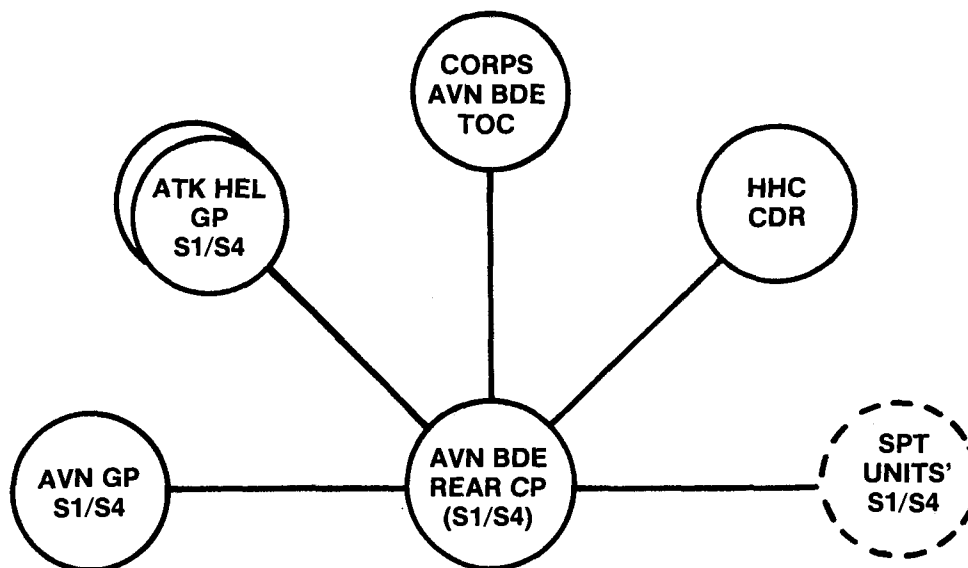


Figure 2-25. Administrative and logistics net in aviation brigade (corps)

e. Multichannel Communications.

(1) The main communication link between brigade and higher commands is the multichannel communications system. The higher-echelon signal unit normally installs and operates this system.

(2) The support radio company of the higher-echelon signal battalion gives multichannel support to the aviation brigade. It provides one multichannel radio terminal (AN/TRC-145). Depending on the tactical situation and the commander's priorities, the aviation brigade may be given a second multichannel terminal to further improve C³ between elements of the aviation brigade and the corps. The AN/TRC-145 multichannel terminal provides from 12 to 24 channels of communication. This major piece of communications equipment transmits the bulk of corps communications at brigade and above.

NOTE: As MSE is fielded, current multichannel systems will be replaced. Chapter 4 discusses MSE in more detail.

f. Wire Communications. When time and distance between units permit, subordinate elements of the brigade are linked with wire.

g. Messenger Support. The higher-echelon signal brigade provides messenger service to the corps aviation brigade. The signal brigade operates a courier service to all the major subordinate commands. Within the aviation

brigade, the S3 liaison section (if authorized by TOE) is the only messenger service available. This section can perform myriad missions. These missions include--

- Delivering receiving reports.
- Obtaining nonroutine distribution.
- Collocating with adjacent or higher headquarters to obtain detailed time-sensitive information during a critical period of the battle.
- Distributing OPLANs, OPORDs, and FRAGOs.

Messengers will reduce the FM signature and provide better in-depth information during the planning or execution of operations. Normally, one messenger (or messenger team) is dedicated to the higher headquarters while the other (if available) performs duties as required.

h. Sound and Visual Communications. Sound and visual signals normally are included in the SOI extract or unit SOP. Signals not included in the SOI may be established by SOP. These signals must be changed often to avoid compromise; yet they must be understood by all. The battlefield has many sounds and signals. For this reason, commanders and staff planners are careful when determining how sound and visual signals will be used and authenticated. Sound and visual signals include lights, flags, hand-and-arm signals, pyrotechnics, and different types of noise such as metal-on-metal sounds, rifle shots, whistles, and bells.

i. Commercial Communications. Commercial lines are used only when approved by higher headquarters. Devices such as the KAL 43 may be used to secure commercial communications. If the unit is forced to withdraw, existing wire lines, including commercial lines (if designated by higher headquarters), are cut and sections removed. Thus the enemy will be unable to use them. Once the defensive battle begins, new lines are seldom laid. The unit then relies on radios, messengers, or sound and visual signals.

2-5. LIAISON OPERATIONS

Just as the aviation brigade integrates liaison elements into its scheme of maneuver for those particular assets, the brigade must also provide liaison to other headquarters. When the aviation brigade places a subordinate unit under OPCON, in direct or general support of another headquarters, liaison is established as soon as possible.

a. After communications have been established, face-to-face coordination is essential. This may be achieved initially by the unit commander. The aviation unit commander must convey the commander's intent and scheme of maneuver for the force so that these are clearly understood. Then a liaison officer or element is collocated with the headquarters.

b. This coordination also allows the aviation commander to synchronize the employment of aviation forces with the scheme of maneuver. Thus decisive

combat power can be concentrated at the proper time and place. Planning and coordination are critical. The liaison officer plays a vital role in coordination.

c. The liaison officer should be an experienced combined arms officer. Also, he should be assigned to the aviation unit that will operate with the ground force. The LO recommends methods of employing aviation forces into the scheme of maneuver to maximize the capabilities of the aviation force. Each liaison officer must also be aware of his unit's status. He must continuously update the maneuver force commander on the aviation unit's situation. The coordination may also include the exchange of critical information such as call signs, radio frequencies, aviation control measures, and A²C² considerations.

d. Each unit should establish SOPs for liaison operations. Thus the LO has a means to first provide the force commander with information and then continually apprise him of the situation. Areas that should be addressed include--

- Unit organization, capabilities, limitations, and status (aircraft, vehicles, personnel).
- Aviation operation employment roles, employment principles, and missions.
- Aircraft capabilities and limitations by type.
- Aviation staff estimate.
- Specific checklists (AASLT, deep attack, air movement tables).
- Common equipment weights.
- Safety briefing checklist.
- Class III/V (FARP) operations, capabilities, and limitations.
- Class V configurations.
- Maintenance considerations.
- Crew endurance/fighter management.
- LO equipment list.

2-6. OPERATIONS SECURITY

Operations security includes all measures taken to deny the enemy information about friendly forces and operations. OPSEC involves all security measures that allow units to achieve and maintain surprise. OPSEC consists of physical security, information security, SIGSEC, and deception and counter-surveillance activities. Because these categories are interrelated, the

aviation brigade commander normally combines more than one technique to counter a threat. Also, the commander can use SIGSEC programs such as EW and SIGINT. By analyzing hostile intelligence efforts and vulnerabilities, executing OPSEC countermeasures, and surveying the effectiveness of countermeasures, the aviation brigade commander can counter specific hostile intelligence efforts. FM 1-100 also describes aviation operations security.

a. OPSEC Process. Operations security is the process of denying adversaries information about friendly capabilities and intentions by identifying, controlling, and protecting indicators associated with planning and conducting military operations and other activities.

(1) Security is maintained throughout all phases of an operation. OPSEC is an integral part of planning, unit training, and combat operations at all levels of command. OPSEC denies enemy forces information about planned, ongoing, or postoperational activity until it is too late to react.

(2) OPSEC is the responsibility of commanders, staffs, and individuals throughout the brigade. The S3 has primary responsibility for OPSEC within the brigade. He is assisted by the S2, who provides information about enemy collection capabilities.

(3) OPSEC teams with SIGSEC and counterintelligence specialties are normally placed in DS of brigades. These teams help determine OPSEC vulnerabilities, assist in updating enemy intelligence threats, and assess Threat vulnerabilities. They report through the IEW support element collocated with the S2 at the TOC.

(4) OPSEC protective measures are developed by--

- Determining the sensitive aspects of the upcoming mission.
- Determining enemy capabilities for obtaining information about the operation.
- Determining what information obtained by enemy forces can compromise the operation and when they would need it in order to react.
- Determining countermeasures and deception requirements.
- Completing an OPSEC estimate (oral or written).
- Preparing an OPSEC or a deception plan (oral or written) or both.

b. Application of OPSEC Techniques and Procedures. OPSEC includes the coordinated application of a range of techniques and procedures that deny information to the enemy. Three kinds of actions are taken under OPSEC: countersurveillance, countermeasures, and deception.

(1) Countersurveillance. Countersurveillance includes all measures to defeat enemy surveillance by ground, air, or electronic means. At the brigade, these include the components and actions discussed below.

(a) Signals security. SIGSEC protects operational information by employing COMSEC and electronic security techniques. These techniques include the use of--

- Secure voice equipment.
- Approved communication codes and SOI.
- Proper radiotelephone operator procedures.
- Multiplexers to reduce the number of emitters at the CPs.
- Antenna positioning to maximize terrain-masking.
- Low-power or directional antennas when possible.
- Wire or messengers when possible.

(b) Information security. Information security prevents disclosures of operational information through written, verbal, or graphic communication measures. Restrictions placed on personnel and release of operational information include the--

- Development of a comprehensive personnel security program to preclude release of classified data to those not cleared for such data.
- Limitation of knowledge of plans and orders to only those who have a need to know.
- Proper distribution and accountability of classified data.
- Use of protective coverings on classified correspondence.
- Isolation of units and individuals before operations to preclude spoken disclosures.
- Establishment of classified trash containers and careful destruction of their contents.
- Use of public affairs personnel when dealing with the media.

(c) Physical security. Physical security is designed to safeguard personnel and to prevent unauthorized access to equipment facilities, materiel, and documents as well as to safeguard them against espionage, sabotage, damage, or theft. Techniques to enhance physical security include--

- Use of security rosters and guards to limit access to CPs.
- Use of approved security containers.
- Use of inventories to account for classified material.

- Detailed preparation of reconnaissance and surveillance plans to include use of patrolling observation and listening posts, ground surveillance radar, platoon early warning systems, and anti-intrusion devices such as mines and trip flares.
- Aggressive use of challenges and passwords.
- Use of passive measures--including concealment of vehicles and facilities through camouflage or by positioning within built-up areas, enforcement of noise and light discipline, and adherence to stand-to procedures. Passive measures may also include using lightweight camouflage nets for aircraft.
- Establishment of guards and reaction forces for support areas and fixed facilities.
- Use of MP to patrol rear areas.

(2) Countermeasures. Countermeasures are taken to eliminate or reduce the success of enemy intelligence collection efforts and early warning of friendly activities. Once a friendly vulnerability is identified and determined to be at risk of detection, a specific counter to the enemy is developed to preclude exploitation. Countermeasures range from deception to destruction of enemy collection capabilities. Examples of countermeasures against specific Threat intelligence operations are as follows:

- Targeting of enemy reconnaissance, intelligence, surveillance, and target acquisition assets or units for suppression, neutralization, or destruction.
- Increase of combat patrols to destroy enemy reconnaissance elements.
- Use of raids to neutralize enemy intelligence targets.

Overcoming one enemy collection effort may be relatively simple. In a multisensor collection environment, however, countermeasure planning must consider all Threat capabilities.

(3) Deception. Deception measures can mislead enemy forces by manipulating, distorting, or falsifying information--causing the forces to act against their interests. Deception planning is integral to operations planning. For a deception to work, the following conditions must be met:

- The deception must be reasonable; operational actions should support planned deceptions.
- The enemy must be given adequate time to react to the deception.
- Units and activities involved in the deception must appear to be what they depict.
- All of the enemy's intelligence-collection capabilities are considered so that each element supports the overall deception.

(a) FM 90-2 contains a comprehensive presentation of deception. Deception operations taken to mislead the enemy may include--

- Feints and ruses.
- Demonstrations.
- Use of dummy equipment.
- Falsification of material placed where it can be captured or photographed by the enemy.
- Manipulation of electronic signals.

(b) The techniques of deception can be combined in various ways. A small force can simulate a larger one by--

- Making the noises of a larger force.
- Mixing actual and dummy positions.
- Raising dust clouds by dragging chains or tree branches behind vehicles.
- Moving a force across an observable area and then returning it under cover and presenting it again and again.
- Creating extra radio stations to simulate traffic of a larger unit.

Deceptions can be as varied as the imagination of the commander. They have been used by successful commanders throughout history. The commander must always think in terms of security (all types), cover, concealment, and deception as combat multipliers.

(c) Deception requires good intelligence, OPSEC, and operations planning to be successful. MI units provide information about the enemy collection capability and the possible enemy reaction. OPSEC analysis provides indicators, signatures, patterns, and profiles about any friendly unit involved in deception. Operations planners should consider applying deception to all combat operations.

c. Communications Security. COMSEC involves physical, cryptographic, and transmission security. COMSEC procedures must be covered in the unit SOP.

(1) Physical security. Physical security protects cryptographic systems and classified documents from capture or loss. Before an area is vacated, it is inspected for messages, carbons, cipher tapes, and copies of maps or orders. Wire lines are patrolled to prevent enemy tapping. The loss or capture of codes or cryptographic equipment is reported promptly to the next higher command. The SOP must contain instructions for destroying equipment and classified documents to prevent their capture or use by the enemy.

The SOI should not be carried forward of the squadron/battalion TOC; when necessary, the signal officer publishes extracts for forward elements. The unit SOP establishes the priority for issue of SOI and extracts.

(2) Cryptographic security. Cryptographic security is maintained by using operation codes, numeral encryption devices, secure voice devices, and other secure communications equipment.

(3) Transmission security. Transmission security limits the enemy's ability to listen to radio signals. Any signal transmitted can be intercepted and jammed by the enemy. All transmissions should be short and treated as if the enemy were listening. Net discipline is the responsibility of all users, but the TOC is responsible for policing the net. Users should--

- Keep radio transmissions short.
- Send lengthy messages by wire and messengers.
- Use secure means or operational and numerical codes.
- Emphasize the use of SOI, SOPs, and standardized terminology.
- Use low-power transmission and terrain to mask signals from enemy direction-finding equipment.

CHAPTER 3

EMPLOYMENT

This chapter implements portions of STANAGs 2019 (Edition Three), 2404 (Draft), 2868 (Edition Four), and 2999 (Edition One) and QSTAG 768.

Aviation provides land component commanders unprecedented capabilities on the battlefield. With the opportunity offered by Army aviation to exploit the third dimension of the modern battlefield, commanders must respond to the challenge of balancing the employment of air and ground maneuver forces to create a decisive maneuver advantage over the Threat. This chapter covers planning considerations, task organization, and employment principles and roles. It is a foundation for commanders and their staffs to use in employing their aviation units. It discusses employment of aviation brigades at all echelons in close, deep, and rear operations.

Section I

PLANNING CONSIDERATIONS

3-1. PLANNING AVIATION OPERATIONS

a. The focus of Army aviation must enhance ground-paced maneuver and exploit aerial maneuver. Thus aviation accelerates the tempo of combat operations while remaining an integral part of the combined arms team. During offensive and defensive operations, the aviation brigade is employed offensively to retain the initiative and offensive spirit critical to successful operations in close, deep, and rear areas.

b. In planning aviation operations, the brigade commander and his staff must consider several factors. The two primary factors are the higher commander's intent and METT-T. After the analysis is completed, a concept of operation is developed. Then orders are issued for execution by subordinate elements. Other considerations include risk analysis and CSS.

3-2. HIGHER COMMANDER'S INTENT

Unit commanders must understand how their actions should complement the overall plan. AirLand Battle doctrine emphasizes exploiting the initiative at every level of command; however, all initiatives must follow the intent of the next higher command. Misinterpretations can lead to counterproductive actions and potentially disastrous results. The higher commander's plans for conducting the battle will dictate the employment of the aviation brigade. Therefore, the brigade commander must not only be cognizant of the mission but also appreciate the ultimate objective of higher-echelon actions. The

commander ensures that his intent is clearly understood. He also establishes guidelines for reacting to contingencies that may develop during the operation. Such planning promotes initiative.

3-3. METT-T

The factors of METT-T include many areas that must be analyzed by the brigade commander and his staff.

a. Mission. The specified task or mission issued to the aviation brigade must be fully understood. The brigade commander and his staff must determine whether his units can fulfill the mission as prescribed. If not, he must convey to higher headquarters what augmentation or support he needs to accomplish the mission.

b. Enemy. Commanders must know enemy doctrine, tactics, forces, and objectives; assess enemy capabilities and intentions; exploit enemy weaknesses; and focus intelligence assets. All information available about the enemy should be obtained through a detailed brigade S2 IPB. This information must be continuously updated and thoroughly disseminated. The IPB is one of the most important aspects of planning. FM 34-130 discusses the IPB in detail.

c. Terrain. The terrain is as important as the mission and enemy. Many details about the terrain can be obtained through the IPB. However, several other factors should also be considered. These include environmental conditions of the aviation brigade's area of operations, the weather, and surface conditions that may affect both friendly and enemy operations.

d. Troops. Troops available include those units assigned to the aviation brigade as well as other forces that may be task-organized with the brigade. Aviation brigades can also accept other aviation forces. Section II covers task organization in more detail.

e. Time Available. Time is also a critical consideration. Time may include time of execution as well as time for preparation of a particular operation or mission. Normally, planning at higher headquarters consumes one-third of the time allocated; subordinate units should be allowed two-thirds of the time for their planning and preparation.

Section II

TASK ORGANIZATION

3-4. ADVANTAGES AND DISADVANTAGES OF TASK-ORGANIZING

Aviation brigades may be employed as an aviation brigade pure force or as a task-organized combined arms force. As a maneuver force, aviation brigades can command and control task-organized armor, infantry, artillery, air defense, and other combat support forces for specified periods of time.

However, an aviation brigade requires additional CS and CSS assets to serve for extended periods as a combined arms headquarters. The brigade can task-organize with other maneuver forces; thus aviation can take advantage of the combat staying power of combined arms operations. In contrast, an aviation brigade pure force offers the force commander the agility and flexibility to create windows of opportunity and to strike aggressively and decisively at Threat operational or tactical centers of gravity. Often, the aviation brigade may also have some of its organic elements task-organized with other brigades. Normally, the division cavalry and air reconnaissance squadrons are employed by the division commander. The combined arms approach provides force commanders the unique capability to accelerate the tempo of ground maneuver operations while employing ground and air maneuver to keep the enemy off balance. 23

3-5. SYNCHRONIZATION OF AVIATION BRIGADE ASSETS

a. As previously stated, synchronization is the arrangement of battlefield activities to produce maximum relative combat power at the decisive point. Synchronization relies on the complementary and reinforcing effects of combined arms and services. It requires a unity of purpose that fuses close, deep, and rear operations. Synchronization also depends on the mastery of time-space relationships as well as knowledge of enemy and friendly capabilities. Careful and complete planning and coordination are extremely important for integrating the combat power of aviation and ground maneuver forces. The goal of synchronization is to use every asset where, when, and in the manner in which it will contribute most to superiority at the point of decision.

b. Forces in combined arms operations complement each other's objectives and coordinate timing. Aviation and ground forces do not always attack along the same axis or have identical objectives. The key is to plan operations that synchronize combat power to constantly pressure the enemy. As an example, Figure 3-1 illustrates different ways of integrating aviation and ground forces in close operations during offensive operations. Figure 3-2 illustrates the integration of aviation and ground forces in close operations during defensive operations. Aviation brigades are integrated into the scheme of maneuver through LOs. Also, aviation unit commanders coordinate face-to-face with ground commanders as described in paragraph 2-5.

3-6. COMMAND AND SUPPORT RELATIONSHIPS

Aviation brigades and subordinate units may operate with other maneuver, CS, or CSS elements during all operations. These assets may be employed in either a command or support relationship, depending on METT-T and the overall scheme of maneuver.

a. Command Relationships. Command relationships are assigned, attached, and operational control as described in FM 1-100. Aviation forces operating in the maneuver role may be placed under OPCON of another maneuver headquarters (normally brigade and higher) for a specific mission or period of time. Aviation forces may also conduct CS and CSS operations under OPCON; however, they will usually operate in a support relationship.

b. Support Relationships. Direct support and general support are the only support relationships that apply to Army aviation CS and CSS operations as described in FM 1-100. For example, assault helicopter and medium helicopter units may perform air movement operations, or command aviation assets may enhance C³I operations.

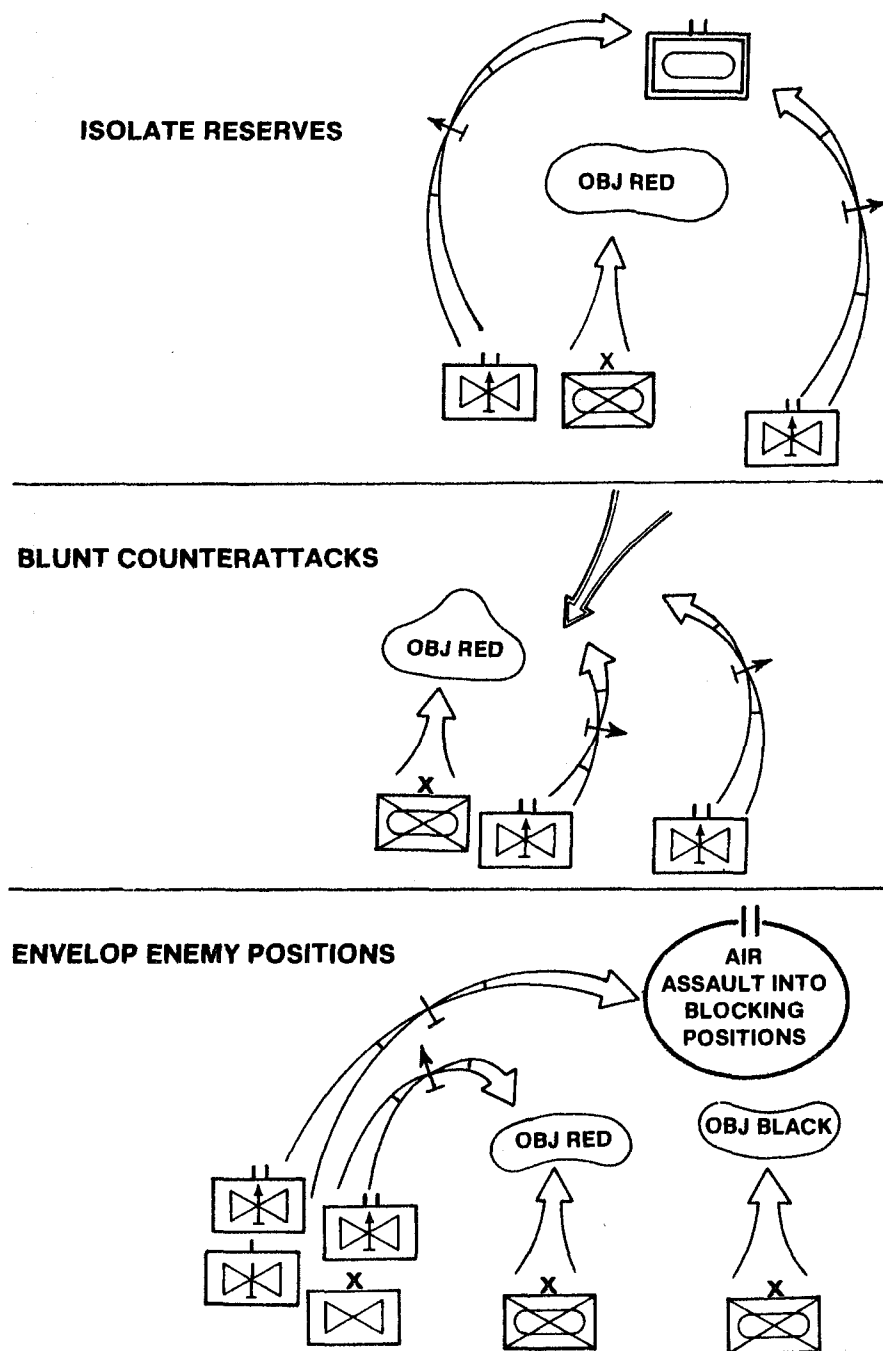
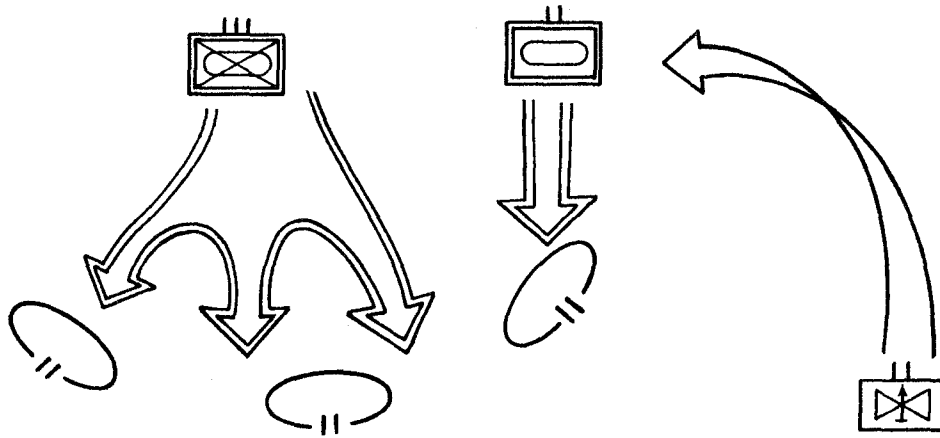
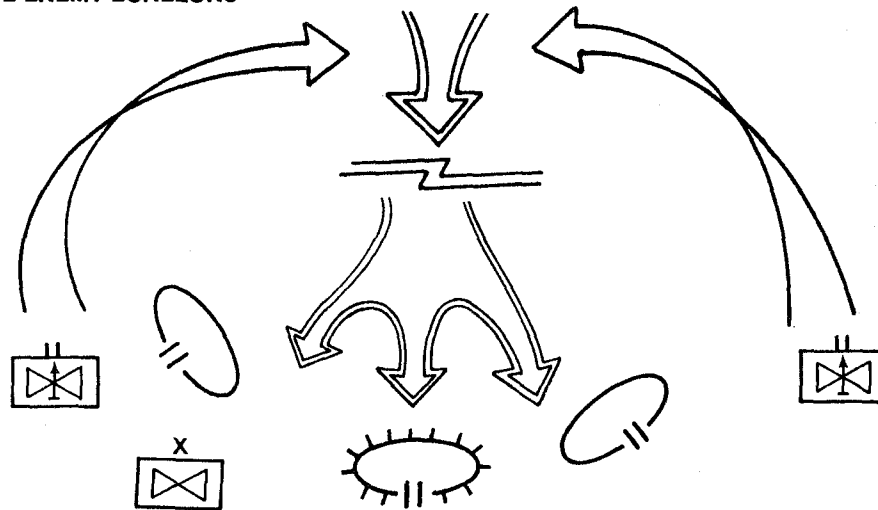


Figure 3-1. Integration of aviation and ground forces in close operations during offensive operations

CONDUCT SPOILING ATTACKS AGAINST UNCOMMITTED FORCES



ISOLATE ENEMY ECHELONS



PREVENT ENVELOPMENT OF GROUND FORCES

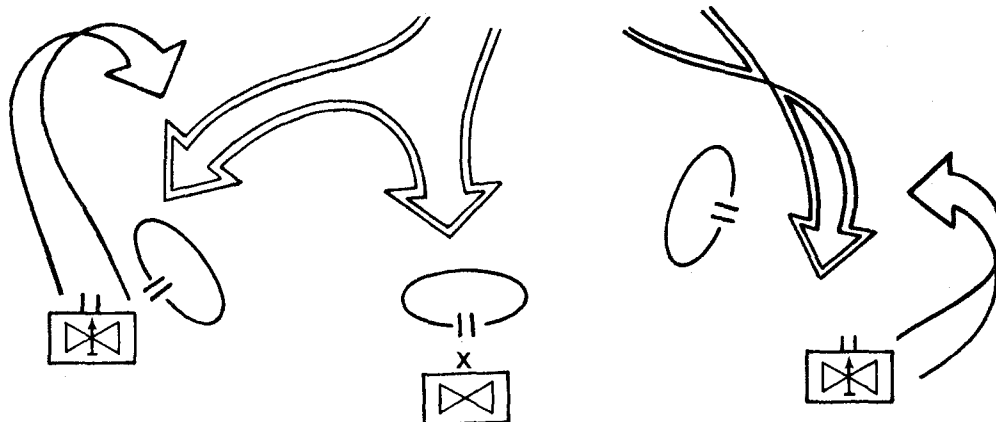


Figure 3-2. Integration of aviation and ground forces in close operations during defensive operations

Section III

EMPLOYMENT PRINCIPLES

3-7. AVIATION BRIGADE CONTRIBUTIONS

Aviation brigades contribute at the strategic, operational, and tactical levels of warfare. Integration of Army aviation into all strategic, operational, and tactical operations will be a decisive factor in achieving overall success during modern combat. Force commanders shape the battle with aerial and ground maneuver forces during combined arms, joint, and combined operations as well as contingency operations across the spectrum of conflict. Army aviation operations, whether enhancing ground-paced maneuver or accelerating the tempo of operations, enable force commanders to retain tactical maneuver advantage over the enemy.

3-8. EMPLOYMENT OF AVIATION ASSETS

a. The employment of aviation units differs little from that of typical ground maneuver forces. The principles below are guidelines for the employment of aviation assets operating on the modern battlefield as described in FM 1-100. These principles are further described as they pertain to aviation brigades.

(1) Fight as an integral part of the combined arms team.

Integration of aviation employment is key to the overall scheme of maneuver. Aviation brigade assets are optimized when integrated into the ground tactical plan. Aviation brigades can conduct independent or pure aviation brigade operations; however, they are normally a member of the combined arms team. Aviation brigades require augmentation to conduct independent operations for extended periods. Whether pure or task-organized, they increase the tempo of operations. When employed as a member of the combined arms team, aviation brigades also help ensure that the enemy has to fight in more than one direction.

(2) Exploit the capabilities of other branches and services. During all operations, aviation brigade assets rely on other branches or services or both. The aviation brigade at any echelon must be employed to offset its own vulnerabilities; thus it will exploit the strengths of other branches and services. For example, during a maneuver operation, ground units expose the enemy. Then aviation forces--including CS and CSS assets allocated to or employed with the aviation brigade--exploit the enemy's weaknesses. These assets must be fully exercised to obtain their maximum potential.

(3) Capitalize on intelligence-gathering capabilities. Aviation brigades provide the force commander with enormous intelligence-gathering capabilities. However, they must also rely on other sources to prepare for gathering intelligence. Thus the commander must focus on his intelligence-gathering assets and integrate or capitalize on the capabilities of all assets available for mutual support.

(4) Suppress enemy weapons and acquisition means. Enemy air defense weapons and acquisition systems may be defeated actively or passively. The aviation brigade commander must accomplish one or both of these tasks. Passive means include terrain flight techniques, employment of ASE, and possibly avoidance. Active measures include direct or indirect weapons employment against a particular target. Aviation brigade elements may perform this mission in a mutually supporting role or depend on other branches or services for this function. During the planning and execution of an operation, aviation brigades must use assets such as attack aircraft, field artillery, IEW support forces, or USAF assets or a combination of these.

(5) Exploit firepower. Aviation brigades allow the force commander to exploit firepower in several ways. Attack helicopter units provide direct and indirect fires during offensive and defensive operations. Aviation units, particularly target acquisition companies and platoons, observe and adjust indirect fires. Assault and medium helicopter units position and resupply AD, antitank, and artillery units across the battlefield. During offensive operations, aviation brigades are best employed as another element of firepower. They lend depth to the force, as in defensive operations, where they may be employed to cover the deployment of ground maneuver forces. They are also well suited to attack trailing enemy formations.

(6) Exploit mobility. Aviation brigades allow the force commander to rapidly position fire and maneuver assets anywhere on the battlefield. These forces quickly position themselves at critical points to counterattack enemy penetrations, exploit and pursue enemy retrograde actions, or influence enemy actions deep in enemy rear areas. Also, aviation brigades conduct air assault and air movement as a part of the overall scheme of maneuver to provide mobility for the force commander.

(7) Exploit surprise. With their increased firepower and mobility, aviation brigades can exploit surprise when and where the enemy least expects it. Aviation forces may be employed day or night and in some adverse weather conditions to enhance the element of surprise. Planning, however, remains critical to the success of the unit.

(8) Mass forces. Mobility plays a vital role in massing forces. Aviation brigade assets can be rapidly positioned and repositioned at critical points on the battlefield. Combat power is relentlessly refocused anywhere on the battlefield to exploit the enemy's weaknesses.

(9) Use terrain for survivability. Although aviation brigade maneuver, CS, and CSS units are not restricted by terrain, they are--in a sense--bound by terrain for survivability. Aviation forces must also use terrain for cover and concealment as their ground counterparts. A²C² is a necessary element; it ensures that a force commander's "airspace" is not violated and that personnel and equipment are not lost needlessly.

(10) Displace forward elements frequently. Aviation brigades are not typically displaced well forward as an entire unit. Elements of the brigade may be employed for a specific mission or period of time based on METT-T.

(11) Maintain flexibility. Aviation brigades greatly enhance a force commander's flexibility. While the focus may be on close or deep operations, aviation brigade assets may be tasked to perform rear operations at the same time or as a separate action. Flexibility provided by aviation brigades allows the commander to combine the firepower and mobility employed with surprise and the massing of troops to conduct combined arms and joint operations.

(12) Exercise staying power. If planned in detail and coordinated properly, aviation brigade assets may be employed for a sustained period of time or for a specific operation. Aviation forces greatly enhance the commander's staying power. However, they must be augmented by CS and CSS to increase their staying power. The payoff must be worth the risk when aviation forces are employed. Equally important is integrating CS and CSS assets with aviation and other maneuver forces; thus these assets are available for future operations, as well as for present operations, based on critical requirements of those operations.

b. The guidelines for Army aviation employment are a collection of flexible, commonsense ideas. They are not to be rigidly applied; these ideas, instead, must be carefully tailored to each situation. Certain situations may require emphasis on one or more of the principles. Leaders must weigh the operational payoff against the inherent risk.

Section IV

EMPLOYMENT ROLES

3-9. MAJOR ROLES AND FUNCTIONS

a. This section describes the major employment roles and other battlefield functions related to the employment principles of aviation brigades. These roles and principles complement the participation of aviation brigades in combined arms, joint, combined, and special operations. The employment roles for aviation brigade operations include maneuver, CS, and CSS. Normally, in the CS and CSS roles, aviation brigades are force providers.

b. Knowledge of the Threat, IPB, and METT-T is the key to properly balancing aviation's employment principles. Thus the commander can achieve success on the modern battlefield.

3-10. MANEUVER OPERATIONS

During maneuver operations, aviation brigades conduct attack, reconnaissance, security, air assault, air combat, and special operations and exercise C². How the aviation brigade performs each mission is covered below.

a. Attack.

(1) Attack helicopter operations are always offensive in nature; however, they may be conducted during offensive or defensive operations. Attack operations include objectives that encompass antiarmor, antipersonnel, air combat, SEAD, JAAT operations, and the destruction of enemy facilities and materiel. Attack operations, particularly during deep operations, also can cause the enemy to divert combat forces and force the untimely commitment of follow-on forces. Also included is the intent to hinder the Threat's future operations and disrupt its CSS operations. Essential elements for attack operations may include an extensive SEAD effort, timely intelligence, C³CM, and well-planned and supportable CSS.

(2) Aviation brigade units shock and overwhelm enemy forces with their speed and firepower; thus they seize the initiative. The commander can mass firepower quickly to prevent the enemy from organizing increased resistance. Once they seize the initiative, brigade forces attack counter-attacking, withdrawing, or moving enemy forces and bypass units or pockets of resistance. Other roles include independently attacking enemy second-echelon forces, forces not tactically deployed or in assembly areas, uncommitted reserves, command and control nodes, and support facilities. Aviation brigade units may screen forward or to the flanks of an attacking force. They may also conduct air combat operations.

(3) Attack helicopter units are ideal for situations in which terrain restricts ground forces. Attack helicopter units are best suited for attacking moving enemy formations. Conversely, they are not well suited for attacking stationary forces in prepared positions. They can attack during deep, close, and rear operations. Working alone or with other units, attack helicopter forces defeat enemy armored formations. To be most effective, however, such missions require other combined arms and joint elements to disorganize and confuse the enemy and to suppress enemy air defenses. Artillery, tactical air support, fires of ground systems, engineers, and IEW assets are integrated into an overall plan. This plan coordinates target engagement and adds to the overall effectiveness of the combined arms team. These attack operations can be conducted while overwatching ground maneuver units and while conducting raids or ambushes in enemy-held territory.

b. Reconnaissance. Reconnaissance operations obtain information by visual observation or other detection methods. This information may concern the activities and resources of an enemy or potential enemy or the meteorologic, hydrographic, or geographic characteristics of a particular area. The division cavalry and air reconnaissance squadrons are normally employed by the division commander to conduct reconnaissance. They may also perform this role for one of the ground brigades or the aviation brigade. The cavalry and air reconnaissance squadrons can conduct zone, area, or route reconnaissance.

Although not their primary mission, ATKHBs can also perform reconnaissance operations. FMs 1-114, 1-117, and 17-95 further describe reconnaissance operations.

c. Security. Security operations obtain information about the enemy. They also provide reaction time, maneuver space, and protection for the main body. Security operations include screen, guard, and cover missions. A screening force--

- Maintains surveillance.
- Provides early warning to the main body.
- Impedes and harasses the enemy with supporting fires.
- Performs counterreconnaissance by destroying enemy reconnaissance elements.

Screen operations are conducted within supporting indirect fire range of the main body. The cavalry squadron normally conducts screening operations for the division commander or in support of a ground brigade. A guard force accomplishes all the tasks of a screening force. Also, a guard force prevents enemy ground observation of and direct fire against the main body. A guard force may reconnoiter, attack, defend, and delay to accomplish its mission. A covering force accomplishes all the tasks of screening and guard forces. Also, a covering force operates outside the range of the main body's indirect fires as a tactically self-contained force. Aviation brigades from heavy divisions typically are not given the covering force mission; however, they may form part of the covering force. The division cavalry squadron is often employed in reconnaissance and screen roles as part of the covering force. An aviation brigade given a guard or covering force mission must be augmented. FMs 1-114, 1-117, and 17-95 further describe security operations.

d. Air Assault. Air assault operations deliver combat forces directly into close combat during both day and night in close, deep, and rear operations. Air assault forces--

- Seize and retain key terrain.
- Engage and destroy rear area threats.
- Counterattack during close and deep operations.
- Conduct raids and deception operations.
- Block or contain enemy forces.

Because aircraft are vulnerable during movement, insertion, and extraction operations, they require support from combined arms resources. Attack helicopter units and field artillery are normally integrated into the movement, insertion, extraction, and ground tactical plans to provide security and to weight combat power. Terrain flight techniques mask unit movements, thus

enhancing survivability and deception. While air assault operations are tied directly to the ground tactical plan, coordination time is normally short. These operations are enhanced when pathfinders or personnel trained in air assault coordinate LZ and PZ activities. Comprehensive SOPs and habitual training relationships also make these operations more effective.

e. Air Combat. Aviation units may encounter armed enemy aircraft at any time and anywhere on the battlefield. Thus units must plan for air security at all times. Air combat operations are planned when enemy aircraft pose a danger to the combined arms operation. All air combat operations must incorporate combined arms elements such as AD, USAF, and other organizations. Therefore, A²C² is a prime consideration. Aircraft employed in offensive air combat operations must receive adequate information on enemy aircraft locations and strengths. Real-time information sharing and airspace coordination are required to avoid fratricide while focusing combat power against enemy aircraft. Acquisition and weapon systems must facilitate targeting of fast-moving aerial platforms at both long (1,000 meters and beyond) and short ranges. By remaining at terrain flight altitudes, helicopters engaged in air combat can take advantage of the protection afforded by terrain. Because these engagements are likely to occur during other operations, flexibility in weapons loading must be maintained. Aviation brigade forces assigned attack, reconnaissance, and security missions must be prepared for air combat, day or night.

f. Special Operations. Aviation brigades may be employed in roles critical to the success of special operations. They may also operate with, augment, or participate in special operations instead of special operations aviation. SOA units provide dedicated aviation support to special operations forces conducting unconventional warfare, direct action, special reconnaissance, combating terrorism, and other SO activities. SOA forces are employed with specialized aircraft to operate day or night and under adverse weather conditions to clandestinely penetrate hostile, denied, or politically sensitive areas. Aviation brigades may be tasked to participate in SOF operations when requirements exceed the capabilities of SOA units. In this situation, aviation forces tailored to perform clandestine missions may insert, resupply, and extract SOF; conduct attack operations; and perform other SOA missions as described in Section X.

g. Command and Control. Aviation brigades allocate resources internally and externally to assist the commander in exercising C². They may provide aircraft merely to allow maneuver commanders to see the battle as it transforms; or they may provide specially equipped aircraft to further assist in C². This role closely equates to C³I enhancement as described in paragraph 3-11.

3-11. COMBAT SUPPORT OPERATIONS

Aviation combat support is the operational assistance aviation assets provide to combat elements. During CS operations, aviation brigades enhance C³I and conduct air movement operations, aerial mine warfare, search and

rescue operations, and air traffic services. In the CS role, the aviation brigade also performs some fire support functions and conducts IEW. These roles are addressed below.

a. C³I Enhancement. Maintaining C³ is critical to any operation. The continuous flow of intelligence is also vital. Operating at long ranges and against enemy electronic warfare hinders C³I.

(1) Aviation brigades can quickly provide reconnaissance, surveillance, and security of lines of communication. These lines include--

- Roads.
- Supply routes.
- Relay and retransmission sites.
- Critical signal nodes.
- Microwave facilities.
- Telephone wire structures and systems.

These lines include future locations. Brigade assets may also have to maintain surveillance of the area or provide security while an area is being established. Assets may deliver messages and documents that cannot be electronically transmitted in an NBC or a jamming environment. Elements have this role most often when radio listening silence is imposed or equipment has become inoperable. Messages include combat plans and orders, written coordination and control measures, and graphics. Documents delivered are critical reports essential for sustaining combat operations.

(2) Brigade elements may perform airborne retransmission or transport retransmission/relay equipment. They may also expedite movement of one or more command posts. Brigade assets permit commanders to easily see the battlefield; thus commanders can better control their units. Other brigade tasks include liaison between units required to transmit intelligence and to verify the unit situation and location. Other intelligence functions include target acquisition and reconnaissance and employment of intelligence-gathering systems such as the EH-60.

b. Air Movement Operations. In this role, aviation brigade assets sustain air and ground maneuver units during close, deep, and rear operations. Air movement operations deliver troops, supplies, and equipment in other than close combat situations. Assault and medium helicopter units are employed with their aircraft in both internal and external load configurations. These operations are normally hampered by a lack of habitual training relationships between the aviation brigade units and the supported units. The external loading of supplies and equipment is a complex operation; it is enhanced when units have and are trained in the use of items such as slings and cargo nets. As in air assault operations, a comprehensive SOP fosters

support of many units by one unit. Darkness enhances the security of these operations. Aviation brigade units emplace and reposition critical combat units, equipment, and supplies for current or future maneuver operations.

c. Aerial Mine Warfare. Aviation brigades conduct aerial mine warfare as a large-scale operation. This operation is part of the overall engineer plan. The entire brigade may be employed with attack or reconnaissance units to secure the operation; at the same time, assault helicopter assets rapidly deliver mines aerially to a designated area as prescribed in the plan. This operation may be conducted in the countermobility role to inhibit the enemy's movement either in an offensive operation or in a retrograde operation to prevent the enemy from withdrawing. This operation promotes friendly offensive operations, particularly while friendly elements are in pursuit. Aerial mine warfare may also assist in friendly mobility operations. Emplacing mines into blocking positions inhibits the Threat from hindering friendly movement.

d. Search and Rescue. Aviation units normally conduct SAR operations to recover friendly downed aircrews. These operations may include locating and extracting friendly ground elements that have been cut off or left behind. This role is not to be confused with medical evacuation.

e. Air Traffic Services. ATS units support A²C² systems as a subordinate element of the Army command and control system. ATS liaison personnel, along with other staff representatives, are located within the division, corps, and theater A²C² elements. They provide functional area (technical) expertise to assist in A²C². ATS integration elements at the FOC and FCC use organic communications and navigational systems to update air operations information. The information pertains to friendly, unknown, and hostile aircraft and the overall A²C² situation. ATS units provide a range of tactical support during deep, close, and rear operations across the spectrum of conflict. This support may include various services required by Army, sister service, and allied aircraft. Some of these services are--

- Navigational assistance.
- Flight following.
- Air threat warnings.
- Weather information.
- Artillery advisories.
- En route navigational structures.
- Landing area terminal control.

ATS elements may provide the main communications link to support Army aviation and ground maneuver unit requirements for establishing and controlling FARPs, PZs and LZs, and temporary airdrop or air-land areas and for joint or combined forces.

f. Fire Support. Aviation brigades are not typically employed as fire support. However, aviation forces do participate in fire support operations. Fire support includes rapid movement and repositioning of fire support weapons and resupply operations as well as target acquisition. Aviation brigade assets are well suited to acquire targets for both direct and indirect fire weapon systems. These assets can locate targets at greater ranges than ground acquisition assets can. New technology enables aerial fire support elements operating from Army aircraft to accurately designate targets for precision-guided munitions. Units of the brigade designated for this task are often employed in combined arms operations with other aviation units. These operations afford mutual support between systems of equal mobility. Also, they dramatically improve the combat effectiveness of the overall scheme of maneuver. These operations increase the accuracy of fires; they also reduce the risk of combat losses of otherwise unprotected helicopters. Aerial observer aircraft will work independently when the protection of attack helicopters is not needed.

g. Intelligence and Electronic Warfare. In the IEW role, aviation brigade assets gather intelligence and perform counterintelligence and counter-counterintelligence. These assets monitor and report enemy activity. They also enhance friendly operations through IEW support.

3-12. COMBAT SERVICE SUPPORT OPERATIONS

Aviation CSS is the assistance that sustains combat forces using aviation assets. During CSS operations, aviation brigades conduct aviation maintenance and air movement operations. They primarily emplace and reposition logistical support: equipment, materiel, and supplies. These operations may also include the movement of personnel. Air movement operations will support the rapid and total mobility of organic aviation units.

a. Aviation Maintenance and Logistics Operations. Aviation maintenance and logistics operations are critical to sustaining all aviation forces. Inherent are the functions required for the CSS of aviation brigade units as well as other maneuver, CS, and CSS forces. Aviation maintenance is provided by internal AVUM assets and external assets such as AVIM. Logistics operations are basically conducted like supply functions of any other unit; however, aviation units may have to help sustain aviation brigade forces.

b. Aeromedical Evacuation. Aeromedical evacuation units assigned to the medical evacuation battalion have the primary mission for casualty evacuation. They are employed well forward in the CZ in direct support of a division area of operations. They may be evacuated from as far forward as the tactical situation permits, normally the maneuver battalion aid station. Aviation units, such as assault or medium helicopter forces, may have to augment the aeromedical capability during mass casualty situations or when the tactical situation dictates. During these situations, commanders must weigh the risk of transporting casualties by nonmedical resources that cannot provide en route medical care. Often, a casualty may have a better chance of

survival if he is left in the care of ground medical personnel until medical assets are available to move him. During heavy commitment of aviation assets, diverting aviation assets from their primary mission can hamper combat operations.

c. Graves Registration. Aviation brigade assets, such as assault and medium helicopter units, may be required to assist in graves registration services by transporting GRREG teams. They also may have to transport the remains of personnel killed in action.

Section V

CLOSE, DEEP, AND REAR OPERATIONS

3-13. SYNCHRONIZATION OF CLOSE, DEEP, AND REAR OPERATIONS

Close, deep, and rear operations make up a special and continuous synchronization requirement. For commanders at all levels, synchronization of close, deep, and rear operations requires deliberate planning and staff coordination. They must understand the relationship among these three arenas and their combined impact on the course of the battle. During close, deep, and rear operations, aviation brigades conduct maneuver, CS, and CSS throughout the spectrum of conflict. As a member of the combined arms team, aviation brigades are key participants integrated into the offensive or defensive plan for close, deep, and rear operations. Moreover, they are employed throughout the battlefield to conduct special-purpose missions and special operations. Aviation brigades serve as a security force as well as a tactical reserve. This section focuses on activities and functions of close, deep, and rear operations and describes the employment of each echelon aviation brigade during these operations.

3-14. CLOSE OPERATIONS

a. Close operations at any echelon comprise the current activities of major committed combat elements together with their immediate CS and CSS. At the tactical level, close operations comprise the efforts of smaller tactical units, such as aviation brigades, to win current engagements. Close operations bear the ultimate burden of success or failure in combat. The success of deep and rear operations is measured by their eventual contribution to close operations. Close, deep, and rear operations are interdependent.

b. Integral activities during close operations include maneuver, close combat (including tactical air), indirect fire support (including counter-fire), CS and CSS of committed forces, and C³I. During close operations, aviation brigades may be employed as a security or reserve force in the security or main battle area. Aviation forces are integrated and synchronized into the commander's scheme of maneuver.

3-15. DEEP OPERATIONS

a. Deep operations comprise activities directed against enemy forces not in contact. These activities are designed to influence the conditions in which future close operations will occur. At the tactical level, deep operations shape the battlefield to obtain advantages in subsequent engagements. Successful deep operations create the conditions for future victory. The principal targets of deep operations are the freedom of action of the opposing commander and the coherence and tempo of his operations.

b. During deep operations, aviation brigades may conduct attack, deep surveillance and target acquisition, deception operations, C³CM, and C³. They may also provide security for a larger force.

c. Generally, the aviation brigade in deep operations will conduct phased operations. These phases should include premission planning, movement to and penetration of the FEBA or FLOT en route to the objective, actions at the objective, and movement to and reentry into friendly lines. Each phase has essential tasks that must be completed.

(1) Phase I--Premission Planning. The organizations involved in premission planning are higher headquarters and the aviation brigade. Their responsibilities are given below.

(a) The higher headquarters--

- Conducts a risk analysis to decide if the mission payoff exceeds the risk.
- Focuses intelligence assets to gather essential mission data.
- Evaluates all deep operation assets to determine which should participate; for example, MLRS, USAF tactical air, aviation brigades, and ground forces.
- Prepares OPORDs, including basic task organization, so that sufficient combat power and assets are available.
- Prepares CSS plans to obtain resources for the operation.
- Provides airspace management and control procedures.

(b) The aviation brigade--

- Focuses assigned intelligence assets to gather essential mission data, tasks intelligence assets from other Army or joint sources as needed and identified during IPB, and identifies enemy air defense locations and dispositions.
- Links the intelligence effort to the higher headquarters.

- Conducts a mission analysis after receiving the OPORD from the higher headquarters.
- Conducts a risk analysis.
- Determines the task organization and requests additional or special combat forces (for example, SEMA assets for communications enhancement while in the deep area of operations).
- Prepares OPORDs, including task organization.
- Prepares CSS plans.
- Plans for medical and maintenance evacuations.
- Prepares aircraft and forces for operations.
- Pre-positions to attack positions as necessary.
- Prepares a fire support plan to include SEAD (for example, MLRS, Lance, tactical air).
- Prepares search and rescue and downed aircrew recovery plans.
- Provides airspace management and control procedures to subordinate units.
- Ensures that the deception plan of higher headquarters supports the scheme of maneuver.
- Positions CSS (minimal amounts) as appropriate.
- Provides liaison officers to units affected by brigade ingress and egress routes and to higher and adjacent units as needed.
- Prepares a SEAD plan and requests or coordinates for other joint assets to support the plan to include movement to and from the objective area.
- Determines friendly dispositions and coordinates air routes to and passage points through the FEBA or FLOT.

(2) Phase II--Movement to and Penetration of the FEBA or FLOT En Route to the Objective. The aviation brigade--

- Focuses all IEW support and executes the SEAD plan (for example, MLRS, Lance, tactical air).
- Observes A²C² control measures.
- Uses minimum-risk routes based on air defense locations and enemy dispositions.

- Uses proper movement techniques to penetrate enemy lines.
- Conducts counterair en route to the objective.

(3) Phase III--Actions at the Objective. The aviation brigade--

- Attacks rapidly and violently.
- Executes contingency operations as required.
- Uses tactical air, as available, to include JAAT.
- Employs air assault forces as appropriate.
- Employs attack helicopters against moving targets, if possible.
- Seeks preplanned secondary targets if primary targets are unavailable.
- Uses all intelligence assets available to locate the target.
- Executes mission-abort if the objective is compromised based on criteria previously established.
- Conducts counterair in a target area.

(4) Phase IV--Movement to and Reentry Into Friendly Lines. The aviation brigade--

- Employs preplanned rally points.
- Employs preplanned minimum-risk return routes other than those used en route.
- Executes the SEAD plan during the return from the objective area, if applicable.
- Extracts CSS.
- Reenters at appropriate passage points that were previously coordinated with frontline friendly forces. (Liaison elements are critical to this phase.)
- Uses signals or IFF to initiate passage. (AD units should watch for enemy helicopters in pursuit of the force.)
- Proceeds to assembly areas.
- Debriefs all crews.
- Forwards intelligence reports to higher headquarters.

Aviation brigades may use various methods to conduct deep operations. However, they are normally employed using several options. These include operations of limited duration, operations to secure a deep objective, and operations to continue the attack. Aviation brigade employment options during deep operations, which depend on the level of employment (EAC, corps, or division), are described in Sections VI through VIII.

3-16. REAR OPERATIONS

Rear operations at any echelon comprise activities rearward of elements in contact. These activities are designed to ensure freedom of maneuver and continuity of operations, including sustainment and C³. FMs 71-100, 100-15, and 100-16 describe rear operations at the respective echelons. Rear operations are critical to subsequent close and deep operations. Aviation brigades play a key role in accomplishing the following four tasks or functions of rear area operations:

- Close and deep operations (CS and CSS) sustainment.
- Movements control (nontactical).
- Terrain management.
- Security.

a. Close and Deep Operations Sustainment. Aviation CS and CSS assets sustain other maneuver, CS, and CSS units in the rear area in support of current and future close and deep operations. They support the tempo of combat, ensuring the agility to take advantage of all opportunities without delay.

b. Movements Control. Aviation units may assist in movements control by providing C² aircraft to monitor or facilitate movements in the rear area. They may also assist through surveillance and protection of MSRs.

c. Terrain Management. Aviation forces participate in terrain management. They provide C² aircraft for rear C² assets to move rapidly in the rear areas to expedite terrain management operations. They also manage their assigned sectors, assembly areas, or support areas.

d. Security. Aviation brigades and subordinate units play a key role in rear area security. Attack, cavalry, or air reconnaissance units assist in the rear IPB. They may reconnoiter likely LZs, DZs, and avenues of approach that may be used by the enemy. They may also detect and delay or defeat rear area levels of threat as described in Figure 3-3. Aviation assets may also perform surveillance or screening operations for identified areas of interest or operations or likely avenues of approach. Aviation brigades or subordinate elements are employed mainly as a tactical combat force to counter Level III incursions. They may delay or destroy enemy forces en route or after they have arrived in the rear area. As a TCF, aviation assets are best employed with other maneuver forces to counter rear threats; however, they may be employed independently.

LEVEL I

Those enemy forces that base or base cluster defenses are capable of defeating.

LEVEL II

Those enemy forces that base or base cluster defenses are not capable of defeating. Response forces, such as MP, are required to counter Level II threats.

LEVEL III

Those enemy forces that have entered the rear area and must be countered by tactical combat forces, such as infantry, armor, and aviation.

Figure 3-3. Levels of threat

Section VI

AVIATION BRIGADES AT ECHELONS ABOVE CORPS

3-17. EMPLOYMENT

Integration of aviation forces into all strategic, operational, and tactical operations will be a decisive factor in achieving overall success during combat. Force commanders will shape the battle with aerial and ground maneuver forces during combined arms, joint, combined, and contingency operations across the spectrum of conflict. Aviation operations, whether enhancing ground-paced maneuver or accelerating the tempo of operations, enable force commanders to retain tactical maneuver advantage over the enemy. With the opportunity offered by aviation to exploit the third dimension of the battlefield, all commanders are challenged to balance the employment of these assets as an integral part of the combined arms force.

a. Aviation forces are integrated with other maneuver forces to offset their inherent vulnerabilities and to exploit the combined strength of the total force. Integrating Army aviation requires all commanders and staffs to be familiar with the requisites of employing these forces on the battlefield. For aviation brigades at EAC, the theater commander, through his G3, must control this pivotal yet limited asset. Aviation brigades at EAC are tactical instruments that greatly influence the force commander's operational level of warfare. Each aviation brigade at EAC is tailored to meet the needs of the theater to which it is assigned. Each brigade will have maneuver, CS, and CSS roles. Employment of these forces in the proper role depends on METT-T.

b. Limited aviation assets at EAC preclude commanders from allocating airframes piecemeal to satisfy all customers. Operations may dictate that aviation forces be allocated mainly for maneuver purposes. At other times, a commander may allocate elements to major subordinate commanders for their use. For example, the aviation brigade commander at EAC may apportion assets through command or support relationships--such as assault or medium

helicopter units--to a theater army area command for a specified time or purpose. In this mission, these assets may be tasked to shore up ground lines of communication and to move critically needed supplies, such as ammunition and fuel, to forward units.

c. In some situations, small numbers of medium helicopter assets are allocated over extended periods to keep supplies moving when land lines of communication are impassable or when items are critical and in short supply. Aviation assets are allocated where the commander needs them the most--maneuver, CS, or CSS. Although most aviation assets at EAC above corps are assault and medium helicopter units, the brigade functions in all three employment roles during close, deep, and rear operations. Also, aviation brigade assets at EAC may become dedicated to special operations. Aviation forces at EAC are mostly force providers.

d. During close, deep, and rear operations, maneuver aviation forces mainly support subordinate tactical units--corps and division. These aviation forces may also conduct joint as well as combined operations. They chiefly consist of attack, assault, and medium helicopter units that conduct attack and air assault operations. These units conduct maneuver operations in close, deep, and rear areas as part of offensive, defensive, and special-purpose operations. They may also serve as a tactical reserve or security force. CS and CSS aviation forces consist of assault and medium helicopter units and command and control assets. These forces focus support for operations in all three areas; however, they are employed mainly in close and rear areas to sustain forces and to ensure continuous operations. Although theater assets are involved in each area of operations, they support close, deep, and rear operations of subordinate units. Therefore, the remainder of this section will address employment of EAC aviation forces in this aspect.

3-18. CLOSE OPERATIONS

During the early stages of a conflict, the force commander shapes the battlefield by using his critical, though limited, aviation assets to offset tactical disadvantages. In close operations, aviation brigades conduct maneuver, CS, and CSS. Maneuver forces include attack helicopter battalions and assault and medium helicopter assets.

a. In brigades at EAC with attack helicopter battalions, maneuver forces may be attached to or placed under OPCON of a combined field command or division aviation brigade. These maneuver forces can--

- Counterattack.
- Attack withdrawing enemy forces or moving enemy reserves.
- Ambush enemy armor formations.
- Conduct air combat operations.

b. When placed under OPCON to another headquarters, EAC attack helicopter battalions are employed offensively, even during a defensive scheme of maneuver. Attack units blunt and channel armor thrusts and often can ambush moving armor forces using JAAT operations. Figure 3-4 illustrates the simultaneous employment of one attack battalion attached to a combined field army and another attack battalion placed under the OPCON of a subordinate division. In the figure, they are employed in separate actions to thwart the enemy's main armor threat and to prevent reinforcements from joining the main force.

c. During close operations, attack assets may be employed as a tactical reserve to blunt enemy counterattacks or a perceived enemy breakthrough. As a reserve, these units may attack to exploit friendly successes. Attack forces also form part of the security force either in the offense or the defense. They may conduct screening operations and augment the guard or covering force. An additional security role may be to provide air assault security, which entails active reconnaissance, screen or guard operations, or a combination of these.

(1) Screen. While employed in a screen for a mobile or stationary force (ground or air assault operation), attack assets maintain surveillance. They must provide early warning, reaction time, and maneuver space. They may also have to conduct counterreconnaissance operations; they can strip away enemy reconnaissance elements and deny the enemy the opportunity to reconnoiter or to surveil friendly operations and forces. Attack assets may quickly make the transition to a guard force in this situation.

(2) Guard. During guard operations, attack assets prevent observation and fire by the enemy on the main body or task force. This role incurs greater risks. The force commander may elect to task-organize a guard force composed of EAC aviation assets and ground maneuver forces. Attack assets can cover an extensive area while continuing to quickly mass combat power to counter enemy attacks.

(3) Cover. During covering force operations, attack as well as assault and medium helicopter units are task-organized under another maneuver headquarters. Attack assets conduct screens and participate in guard operations. They may also serve as a tactical reserve force. Other aviation assets reposition artillery and infantry forces to block enemy penetrations, harass enemy movement, and counterattack.

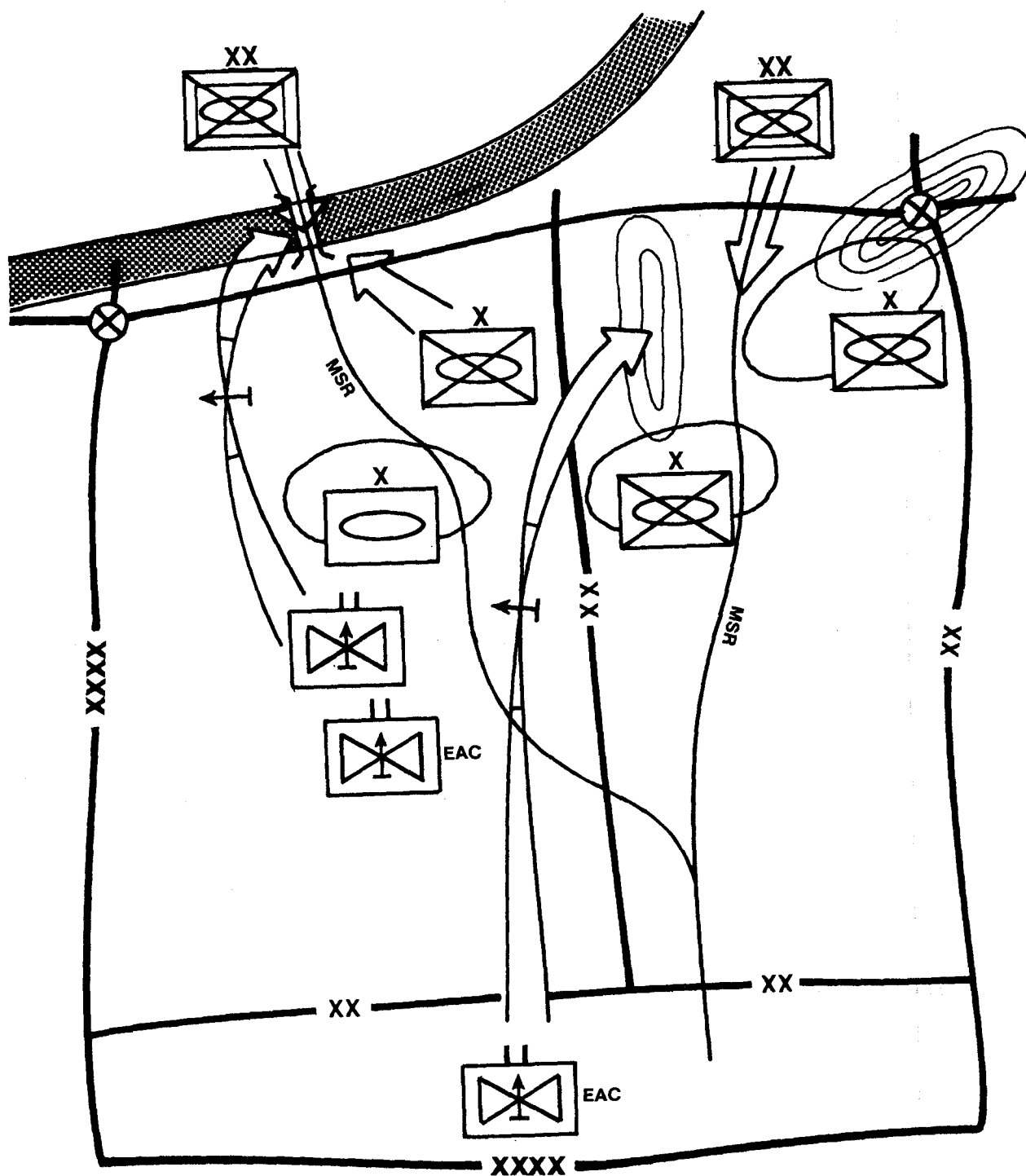


Figure 3-4. EAC attack battalions employed simultaneously

(4) Air assault security. During air assault operations, attack helicopter units provide security for the air assault task force; that is, they conduct reconnaissance and screen operations and briefly make the transition to a guard role if required. Reconnaissance operations include area reconnaissance of the pickup zone, if necessary, to ensure that the area has not been compromised. These operations also include quickly reconnoitering the landing zone and possibly the objective area to obtain the latest intelligence on enemy activity and the battlefield environment. These forces may also conduct an air route reconnaissance to provide early warning for hazards to flight--both natural and man-made. Route reconnaissance can also provide reaction time in case enemy forces, such as air defense artillery, are present along the route. Attack assets may be required in this role to suppress enemy air defense systems or to conduct air combat operations to protect the force. During the screen, these attack units position themselves away from the AATF to detect, locate, identify, and report enemy forces. Subsequent positions along likely avenues of approach or observation must also be planned in the event the screening force is placed in the guard role. Figure 3-5 illustrates an attack battalion employed with an air assault task force to provide security.

d. During close operations, assault and medium helicopter units--as well as C² aircraft--conduct maneuver, CS, and CSS. These units--

- Augment air assault forces to bypass obstacles or reach an important objective by surprise such as seizing key choke points.
- Conduct air movement of critical personnel, equipment, and supplies throughout the operational areas.
- Conduct deception operations in support of maneuver and operational missions.
- Conduct air movement of chemical and nuclear weapons.
- Insert or extract and resupply special operations forces.
- Provide C² aircraft so that battlefield commanders can more easily direct their units.

e. Assault and medium helicopter assets support close combat in a theater-level operation as part of an air assault task force during joint or combined operations as well as with subordinate US divisions. In this role, assault and medium helicopter forces insert dismounted infantry or other forces available to seize key terrain, such as a bridge or a village; to assist friendly counterattack elements; or to cut off withdrawing enemy forces as well as reinforcements.

f. As the conflict progresses, these forces are also allocated to position fighting forces and supplies for the counterattack, particularly across rugged or impassable terrain. EAC aviation forces also conduct feints, raids, demonstrations, and insertions or extractions of

unconventional warfare forces to keep the enemy off balance. Figure 3-6 shows one medium helicopter battalion and two assault helicopter companies employed in a combined AATF. The medium helicopter battalion conducts an air assault on an infantry regiment to prevent enemy reinforcements from assisting units engaged by attack assets. One assault helicopter company conducts an air assault with an infantry battalion (-) to seize a key bridge, which allows friendly ground forces to attack the main force. Another assault helicopter company inserts special forces teams for reconnaissance operations; at the same time, it conducts a demonstration. The demonstration is intended to portray another AATF operation to divert enemy attention from all other friendly operations.

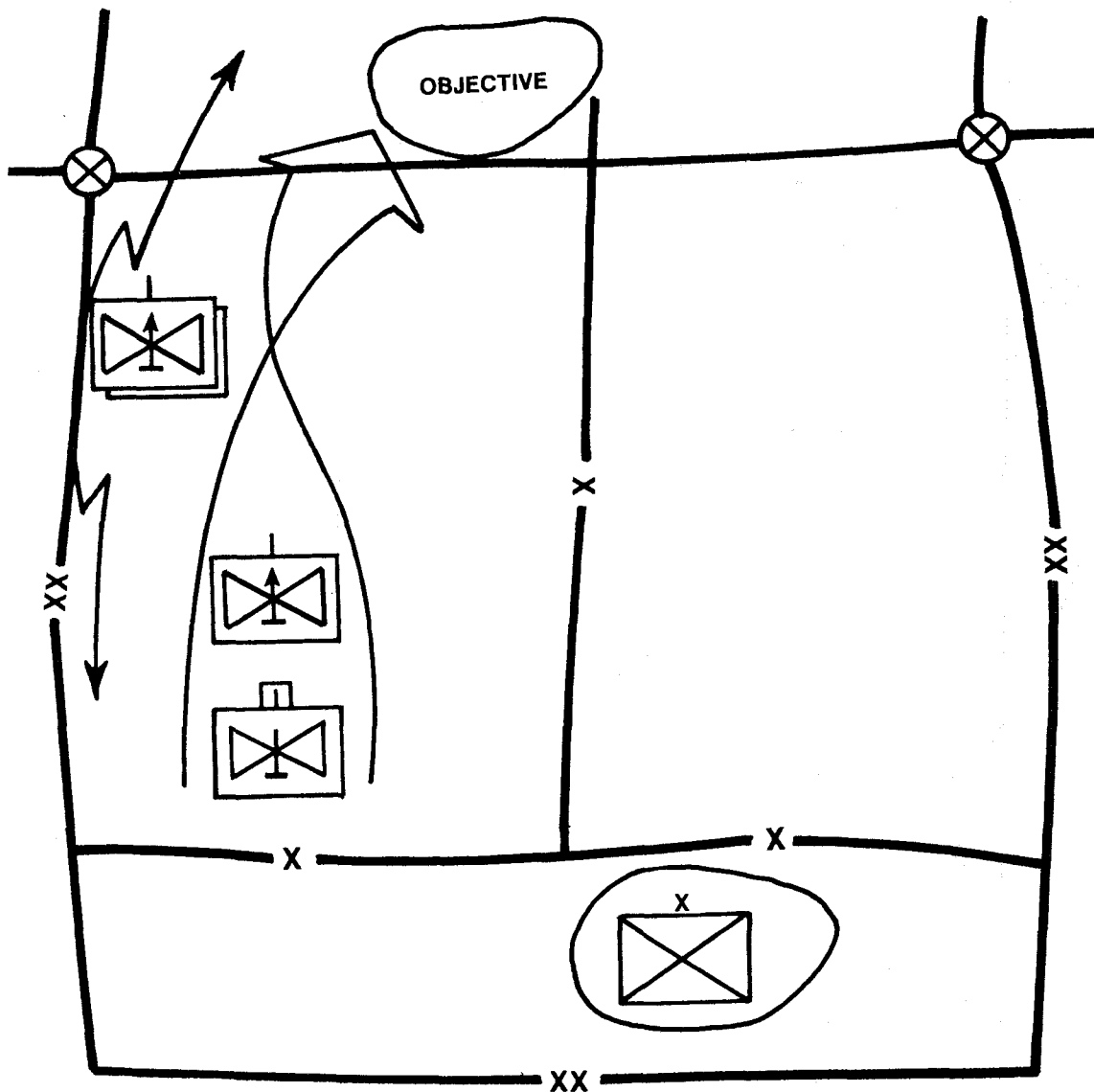


Figure 3-5. Attack battalion providing air assault security for an AATF

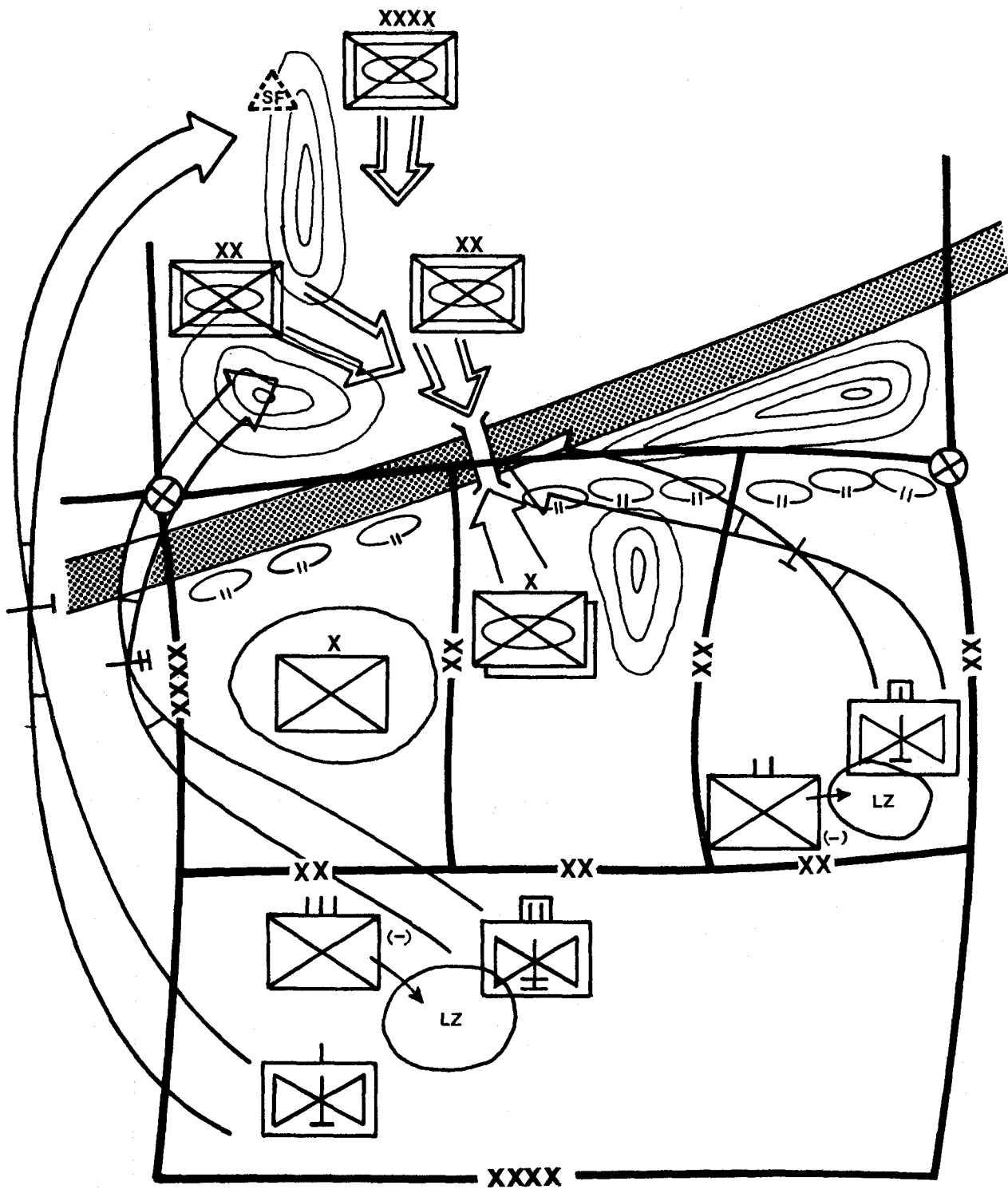


Figure 3-6. Assault and medium helicopter units employed with an AATF

3-19. DEEP OPERATIONS

During deep operations, the aviation brigade at EAC is to meet a specific requirement such as attaining a particular objective or operating for a specified time. Theater attack assets may normally be employed under OPCON of a subordinate corps or division as in close operations. Theater aviation assets, such as assault and medium helicopter units, may have to assist in the deployment, resupply, or recovery of forces. Theater aviation assets may also support special operations forces and conduct SOA operations.

a. Aviation brigade forces at EAC are employed chiefly to provide CS and CSS for deep operations. However, assault and medium helicopter units may be employed in air assault operations or special operations. Those theater assets with attack forces may also be committed to engage and destroy second-echelon forces before they are committed to the close fight. These assets may also help locate and destroy enemy logistical bases and C² nodes and disrupt enemy lines of communication. These aviation assets conduct deep operations so that they can--

- Limit the enemy's freedom of action.
- Attack the tempo of the battle in favor of subordinate units.
- Isolate the close operation on advantageous terms (reducing the enemy's closure rate through attrition, delay, disruption, or destruction of specific enemy forces or elements).

b. Continuous planning and synchronization of time, space, and resources produce successful deep operations. Deep operations are founded on timely anticipatory intelligence (based on IPB). This information provides a clear view of the enemy's capabilities and probable intent. These assets provide an exceptional weapon to conduct deep operations at theater level; however, this is a high-risk method of employing these forces. An in-depth analysis can determine whether the inherent risk justifies the potential payoff.

c. CS and CSS for deep operations may be limiting factors. Therefore, support from subordinate theater assets necessitates thorough coordination among combined arms team members. A²C² will also be critical for such an operation. Exit and reentry of friendly lines require extensive planning, particularly in a combined operation. These attack forces most often will be employed in a deep operation by the theater commander; however, they may be placed under OPCON of a combined field commander. In this situation, the aviation brigade commander at EAC may tailor organic assets to support attack helicopter forces in a theater or combined-level deep operation. Figure 3-7 shows EAC aviation assets conducting deep operations. An attack helicopter battalion conducts a deep attack to halt a second-echelon force en route to reinforce a committed enemy force. Medium and assault helicopter units assist in providing logistical support (Classes III and V) by delivering supplies to a FARP.

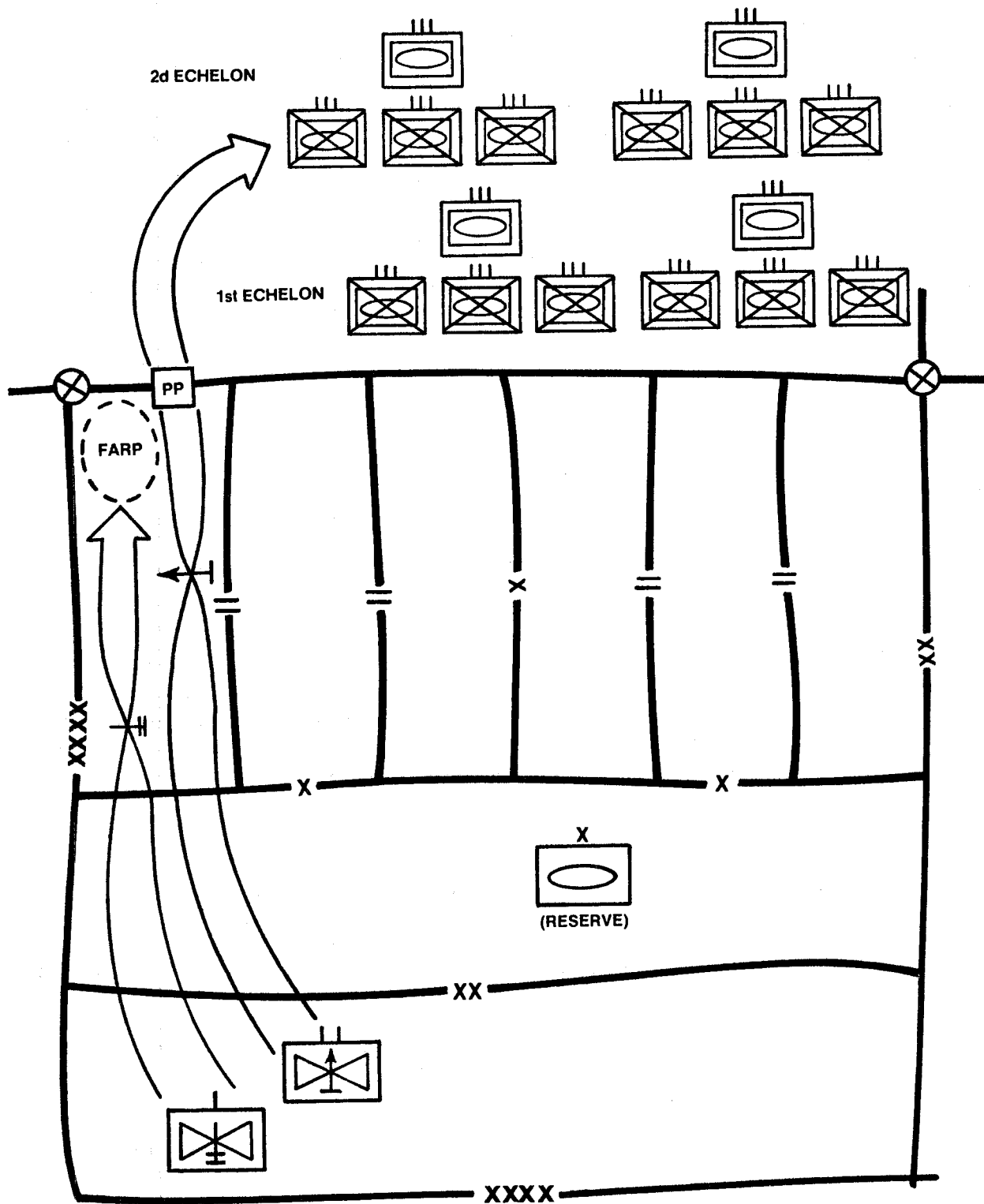


Figure 3-7. EAC aviation brigade assets conducting deep operations

3-20. REAR OPERATIONS

Theater attack and assault helicopter assets may counter rear area Threat incursions and remain responsive to the commander in close and deep operations. They may also be employed in a deliberate air combat role. Observation, assault, and medium helicopter units continue to provide CS and CSS that sustain theater operations. They also enhance C³I of theater operations.

a. The only protection afforded to a theater's rear operations may be the aviation brigade at EAC. In theaters with subordinate attack assets, these units may be employed again as a tactical reserve to counter a Level III incursion into a theater's rear area. They may also conduct reconnaissance and security operations in specified rear areas and assist with the rear IPB. They reconnoiter and surveil potential landing zones and maintain lines of communication.

b. The primary employment of aviation assets at EAC in rear operations is logistical resupply. These air movement operations may involve logistics over-the-shore resupply from ships or movement of equipment and supplies in large quantities from rear logistical bases to forward-deployed COSCOMs or DISCOMs. Attack forces from EAC may also be employed while air assault forces react to the rear incursion. Assault and medium helicopter units are employed with combat forces, possibly in reconstitution operations, to conduct these air assault operations. Figure 3-8 shows one attack helicopter battalion engaging and destroying an enemy rear attack while air assault forces are inserted to close with and destroy the incursion.

c. Rear area command and control at echelons above corps is complex. EAC aviation forces are integrated and synchronized through rear TOCs located at army theaters or support group CPs. FM 100-16 describes rear operations at EAC in more detail.

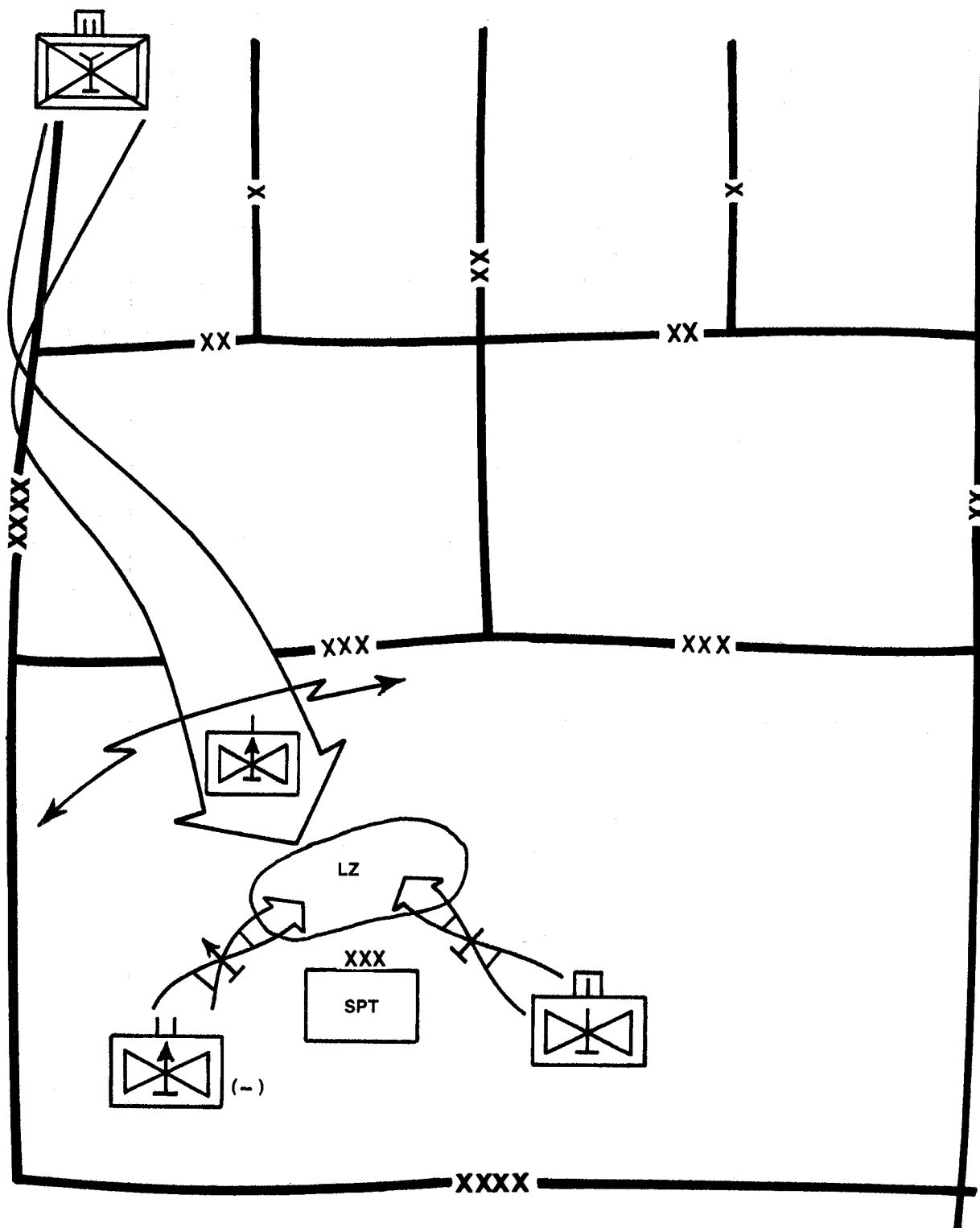


Figure 3-8. Aviation brigade assets countering a Level III threat incursion

Section VII

CORPS AVIATION BRIGADES

3-21. EMPLOYMENT

The corps aviation brigade's orientation and methods of employment differ little between offense and defense. Because of its organization, the corps aviation brigade is well suited to destroying enemy forces and to seizing or retaining the initiative through operations in depth. Also, it plays a vital role in providing assault and medium helicopter forces and C² assets to support the corps scheme of maneuver. The corps aviation brigade allows the corps commander to weight his combat power when and where required through maneuver, CS, and CSS operations. This section addresses employment of the corps aviation brigade during close, deep, and rear operations; it applies to both offensive and defensive missions. Within the corps scheme of maneuver, the aviation brigade may operate directly for the corps commander as a pure aviation brigade force or be task-organized with other corps assets such as a separate brigade or an ACR. It may be employed with or under OPCON of a subordinate division as well as a joint or combined force.

3-22. CLOSE OPERATIONS

At corps level, close operations are conducted mainly within the divisional area of operations. Therefore, for those operations, corps aviation brigade assets may normally be under the OPCON of the division aviation brigade. Corps attack helicopter forces will be under this command relationship based on a specific time and mission. An attack helicopter group may be assigned as the C² link between subordinate battalions and a division aviation brigade. Corps aviation brigade forces may also serve independently for the corps commander in a division's area to exploit successful operations or to fill weak gaps penetrated by Threat forces.

a. Additional combat power may augment covering or ground maneuver forces. It can also exploit exposed enemy weaknesses created by other maneuver forces.

b. The corps aviation brigades chiefly conduct attack, security, air assault, and air movement operations throughout the corps and often throughout subordinate divisions during close operations. The corps aviation brigade seldom participates in close operations as a pure aviation brigade force; however, it may be employed independently. When given such missions, an attack helicopter group usually has to be augmented with CS and CSS assets. When these operations require seizing or holding terrain, ground maneuver forces must also augment the force.

(1) Attack. Attack helicopter groups conduct attack operations. These operations may include hasty or deliberate attacks during offensive or defensive operations.

(a) Offensive operations. During offensive operations, corps attack helicopter forces exploit successful friendly operations as depicted in Figure 3-9. Here, they attack enemy forces to isolate them and deny them the attempt to withdraw, reinforce, or counterattack. Corps attack assets may accomplish this independently, as a member of a JAAT operation, or in concert with a ground maneuver force. These assets normally are employed in this role for a particular mission or time frame.

(b) Defensive operations. In the defense, aviation assets lend depth and coverage to defensive fires and cover the redeployment of ground maneuver units. Aviation assets may delay and disrupt an attacking enemy force early in an engagement. Such employment, however, is usually desirable only when defending maneuver units require time to prepare their positions or when an enemy attack depends on a few critical systems; for example, bridging equipment supporting a river crossing. In this situation, corps attack forces normally counterattack independently or for a subordinate division. They may also fulfill this mission as a tactical reserve. In a division-level penetration, the timing of the counterattack is critical. The intent is to deny the concentration and subsequent breakout of enemy follow-on divisions, thus regaining the initiative. The corps commander synchronizes this event with divisional efforts, which enhance the synergy of the maneuver and divide the attention of the enemy commander. In the example depicted in Figure 3-10, an attack helicopter group counterattacks by fire into EA STOREY. This counterattack is intended to destroy a follow-on force moving to exploit the perceived success of a first-echelon division. Such applications require extensive planning and preparation. The Class III and V materiel must be pre-positioned; intelligence resources must be focused; enemy AD systems must be suppressed, as required; and coordination with all affected units must be completed. Coordination includes--

- Scheme of maneuver.
- C³.
- Allocation of terrain for support facilities (FARPs).
- IEW support.
- Passage of lines.
- Deception plan.
- Tactical air support.
- Fire support and control measures.
- CS and CSS positioning.
- Airspace allocation.
- Medical evacuation.

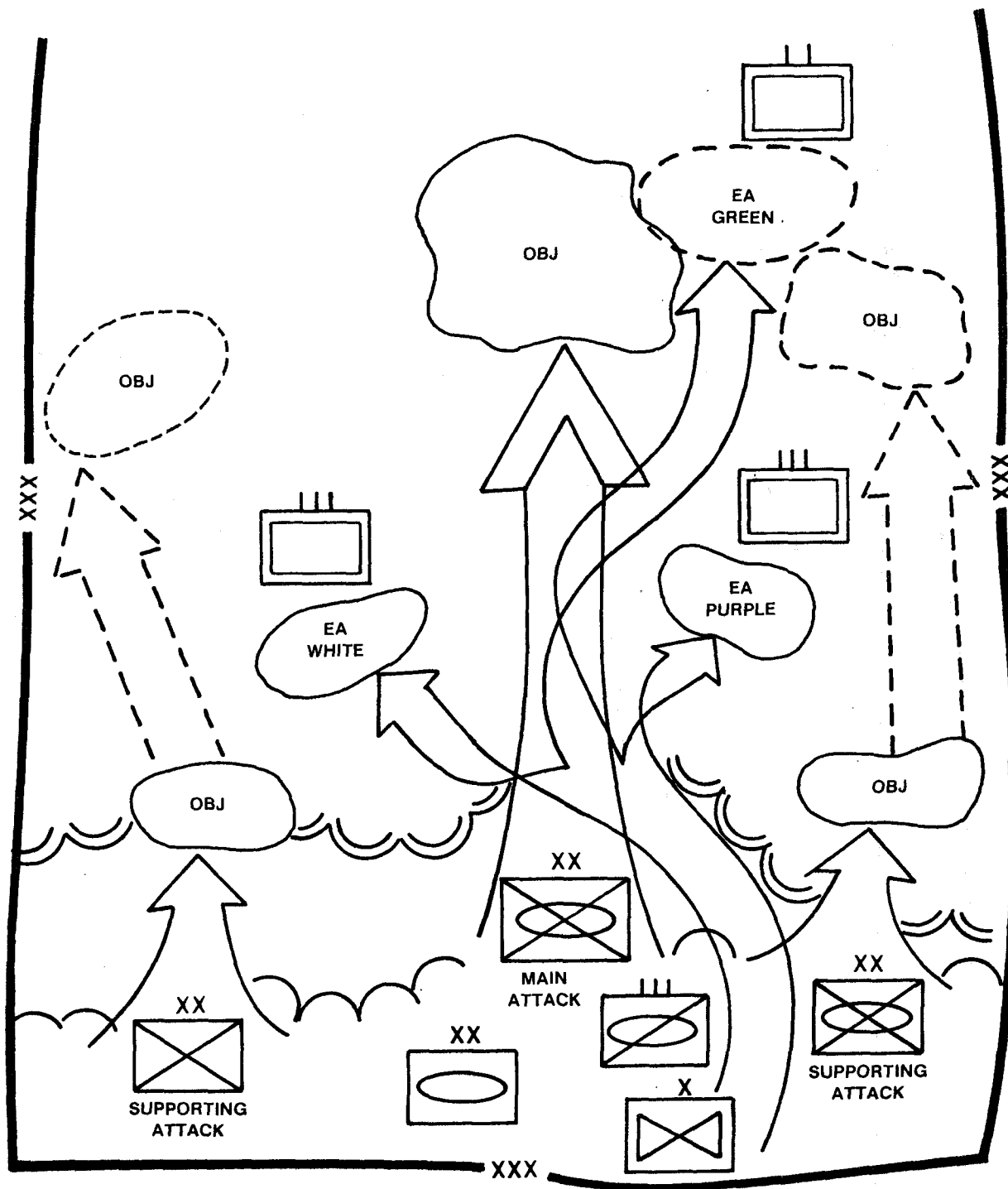


Figure 3-9. Corps attack and supporting forces conducting attack operations during corps close operations

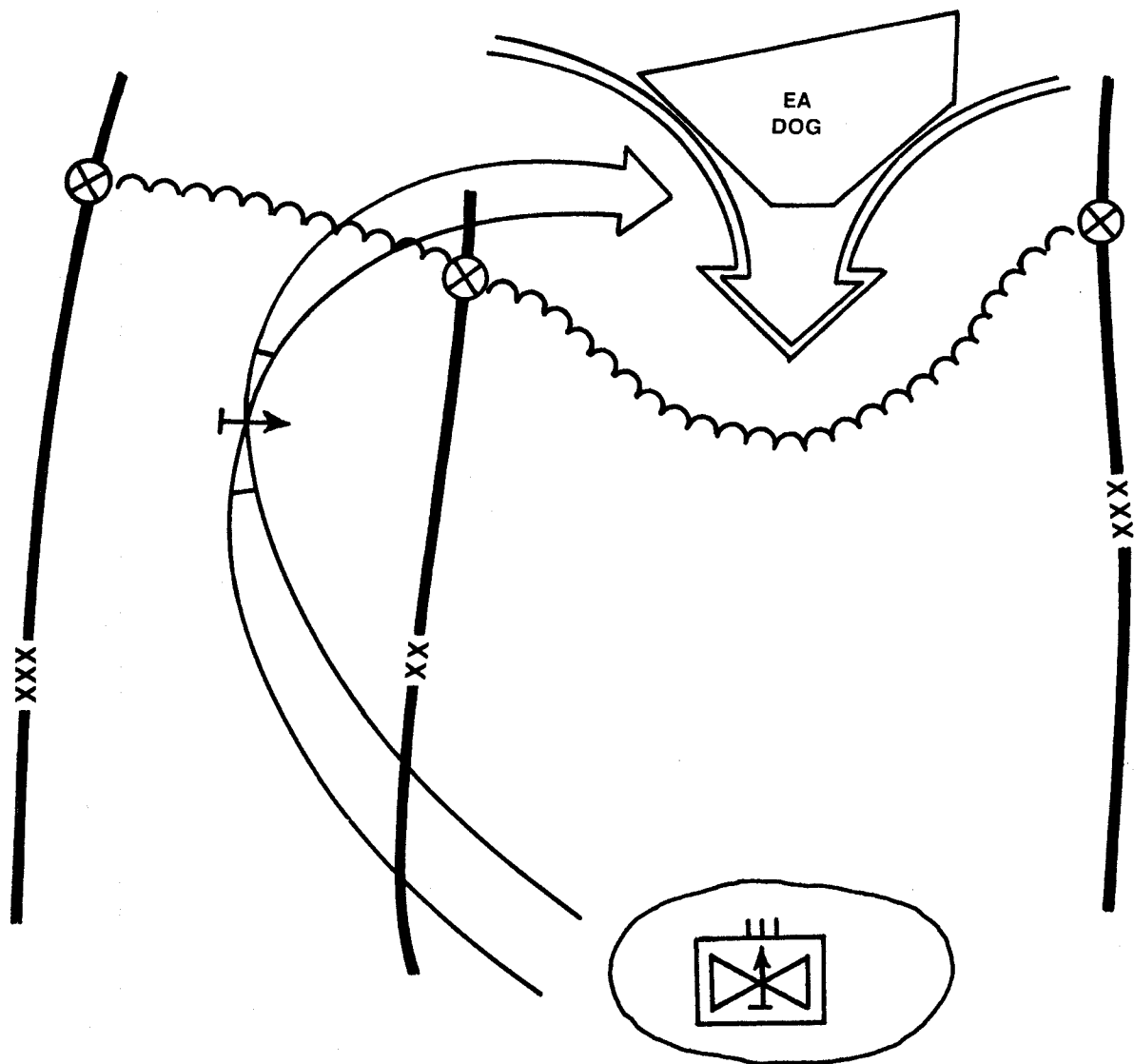


Figure 3-10. Attack helicopter group conducting a counterattack

The aviation brigade coordinates initially within these areas for subordinate attack helicopter groups. However, the group may be responsible for final coordination for its subordinate battalions. Attack helicopter systems are especially well suited to attack trailing enemy formations, which are typically more congested and not tactically deployed. Such forces allow easy target acquisition; they are also vulnerable to flanking fires.

(2) Security operations. The most likely employment of corps aviation assets in security operations would be to augment a ground maneuver unit such as the ACR. However, the brigade may be given independent missions to screen, guard, or cover. It must be augmented to conduct guard and cover operations. In the corps without an assigned ACR, the air reconnaissance squadron may conduct screening operations. It may operate with corps attack assets or independently to serve as the "eyes and ears" for the corps commander. Without augmentation, such missions pose significant risk. Considerations for augmentation are driven by METT-T and the commander's intent. Aircraft operate in an unforgiving medium. The price of their mobility is the lack of inherent protection. Therefore, they should be employed against ground combat elements in conditions that minimize their exposure. Thus ground maneuver must expose enemy units so that aviation units can exploit this exposure. Security operations may best be accomplished by combined arms, joint, or combined forces.

(a) Screen. When given a screen mission, the corps aviation brigade or a subordinate attack helicopter group of the brigade must maintain surveillance. It must provide early warning to the main body and must impede and harass the enemy with supporting indirect fires. It may also be tasked to destroy enemy reconnaissance elements. Figure 3-11 depicts elements of an attack helicopter group task-organized to conduct a screen on a corps flank. By task-organizing the group, both air observation and ground observation are possible. As the speed increases in the main body, the distance between observation posts should also increase. The aviation forces tie the overall screen together. They also provide overwatching fires for the boundary ground elements. In addition to the attachment of the ground battalion task force, CS elements must augment the group. These elements include IEW support, engineers, FA, AD, and signal.

(b) Guard. During guard operations, the brigade must prevent direct observation and fire by the enemy on the main body. Thus ground maneuver units must be attached and positioned on avenues of approach leading into the main body of the corps. Once again, the highly mobile attack helicopter groups can cover an extensive area while continuing to quickly mass combat power to counter enemy attacks. If tied into corps intelligence resources, these aviation forces can monitor enemy actions closely; these forces can frustrate counterattacks before enemy forces reach the main body. An example of one such operation is shown in Figure 3-12.

(c) Covering force. When designated as the corps covering force, the aviation brigade must have enough ground maneuver forces and CS assets--including additional communications support--to achieve the full effect of the combined arms team. The strength of the covering force will depend on the size of the security area and the intensity with which the

corps commander intends to fight the battle. It will also be based on the number of other contingencies for which the corps must prepare. The brigade as a whole may or may not be employed in such operations. Normally, only those corps aviation brigades assigned to corps without an assigned ACR are employed as a covering force headquarters. The attack helicopter group headquarters may be given the mission and augmented as necessary (Figure 3-13). During covering force operations, specific tasks for corps attack assets include reconnaissance or screening operations. These assets may also be held as a tactical reserve to exploit friendly attacks or to counterattack enemy penetrations. Assault and medium helicopter units provide assets to conduct an air assault on other counterattack forces. They also provide CS to reposition critical personnel, equipment, and supplies.

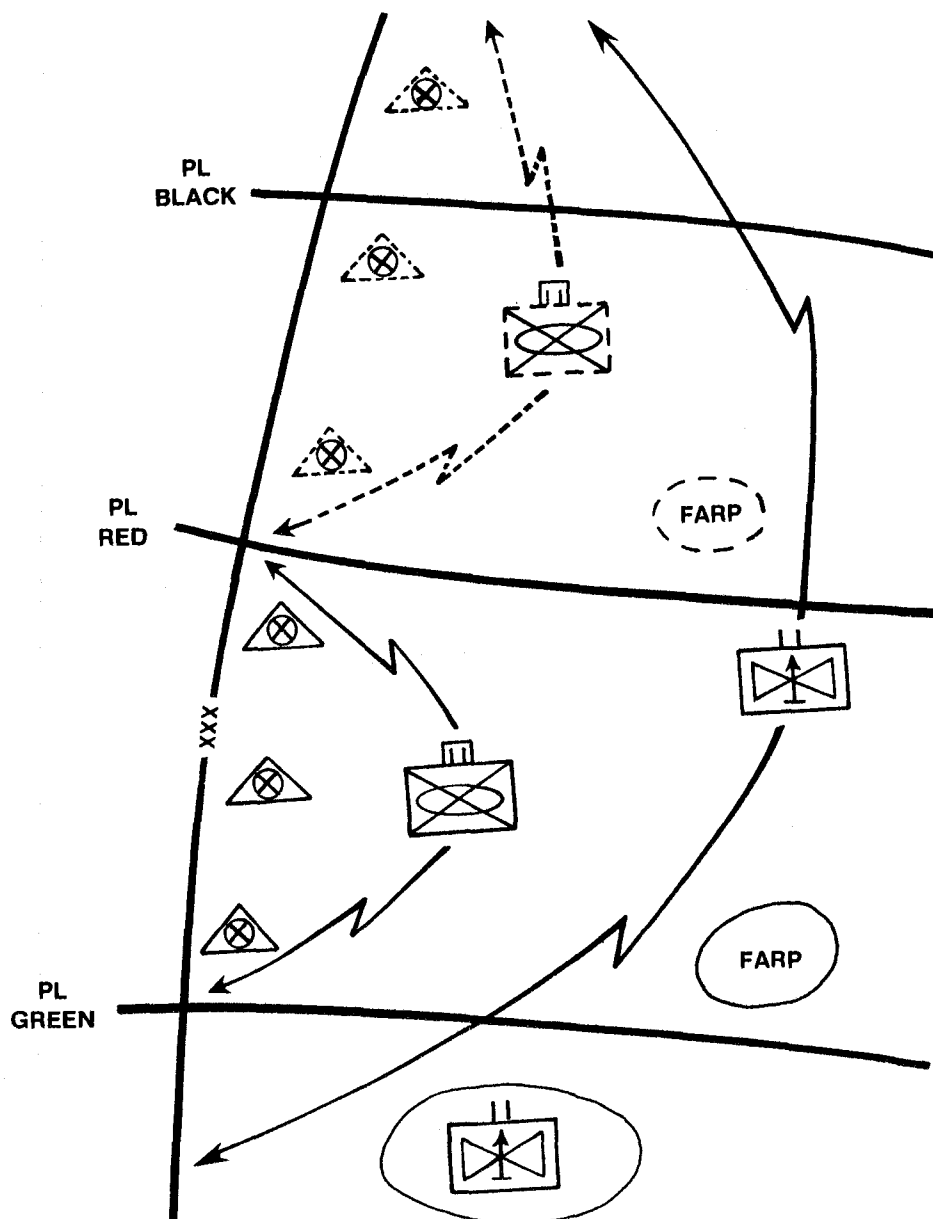


Figure 3-11. Task-organized group conducting a screen

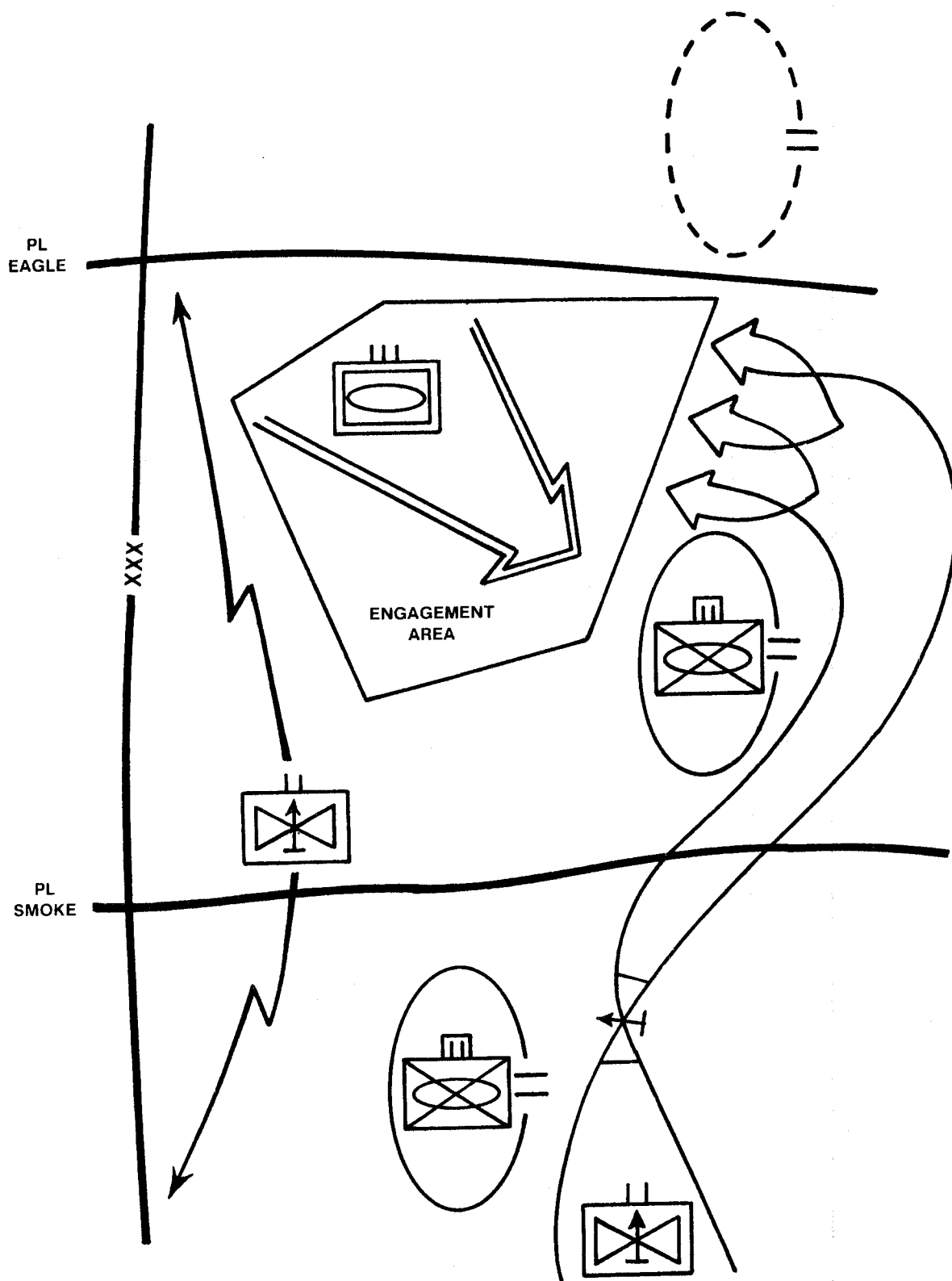


Figure 3-12. Attack helicopter group task force conducting a guard mission

TF 1-502 IN (AASLT)
 1-502 IN (AASLT)
 B/1-3 FA (DS)
 2/A/1-541 AD (DS)
 2/C/54TH ENGR (DS)

120TH ATK HEL BN
 210TH ATK HEL BN

TF 1-81 MECH
 1-81 MECH
 B/4-68 AR
 C/1-3 FA (DS)
 3/A/1-541 AD (DS)
 3/C/54TH ENGR (DS)

GROUP CONTROL
 1-3 FA (-) (DS)
 158TH AHB
 159TH MHB
 A/1-541 AD (-) (DS)
 C/54TH ENGR (-) (DS)

Figure 3-13. Sample task organization for a corps covering force mission under attack helicopter group control

(3) Air assault. Corps aviation brigades may participate in air assault operations with corps units such as a separate brigade, subordinate division, or joint or combined force. These particular air assault operations may be conducted to seize key terrain to aid a division's offensive operation or to deny the enemy a specific objective. Assault and medium helicopter units provide the means by which combat forces are rapidly and violently positioned on key terrain or objectives. Attack helicopter forces provide air assault security through reconnaissance, screen, and possibly guard operations as already described.

(a) Figure 3-14 shows corps aviation brigade assets employed with forces from a subordinate division (light infantry) to conduct air assault operations. Here a ground brigade has been task-organized with one ATKHB and one AHB. It has also received command aviation battalion assets. Attack assets are tasked to perform an air route reconnaissance so that they can--

- Detect and report natural and man-made hazards to flight.
- Detect, locate, and report enemy AD systems and provide SEAD.
- Conduct area reconnaissance of PZs, LZs, and objective areas.
- Provide additional firepower during the execution of the ground tactical plan.

(b) ATS units may also provide tactical navigation during the air assault. These assets receive mutual support from assault forces for insertion or extraction and security from attack assets. Other assault assets may also conduct special-purpose missions, such as a feint or demonstration, as part of the deception plan. Assault and medium helicopter units can also position fire support assets and AD systems, such as Vulcan or Stinger teams, to support the brigade providing fire support to the air assault operation.

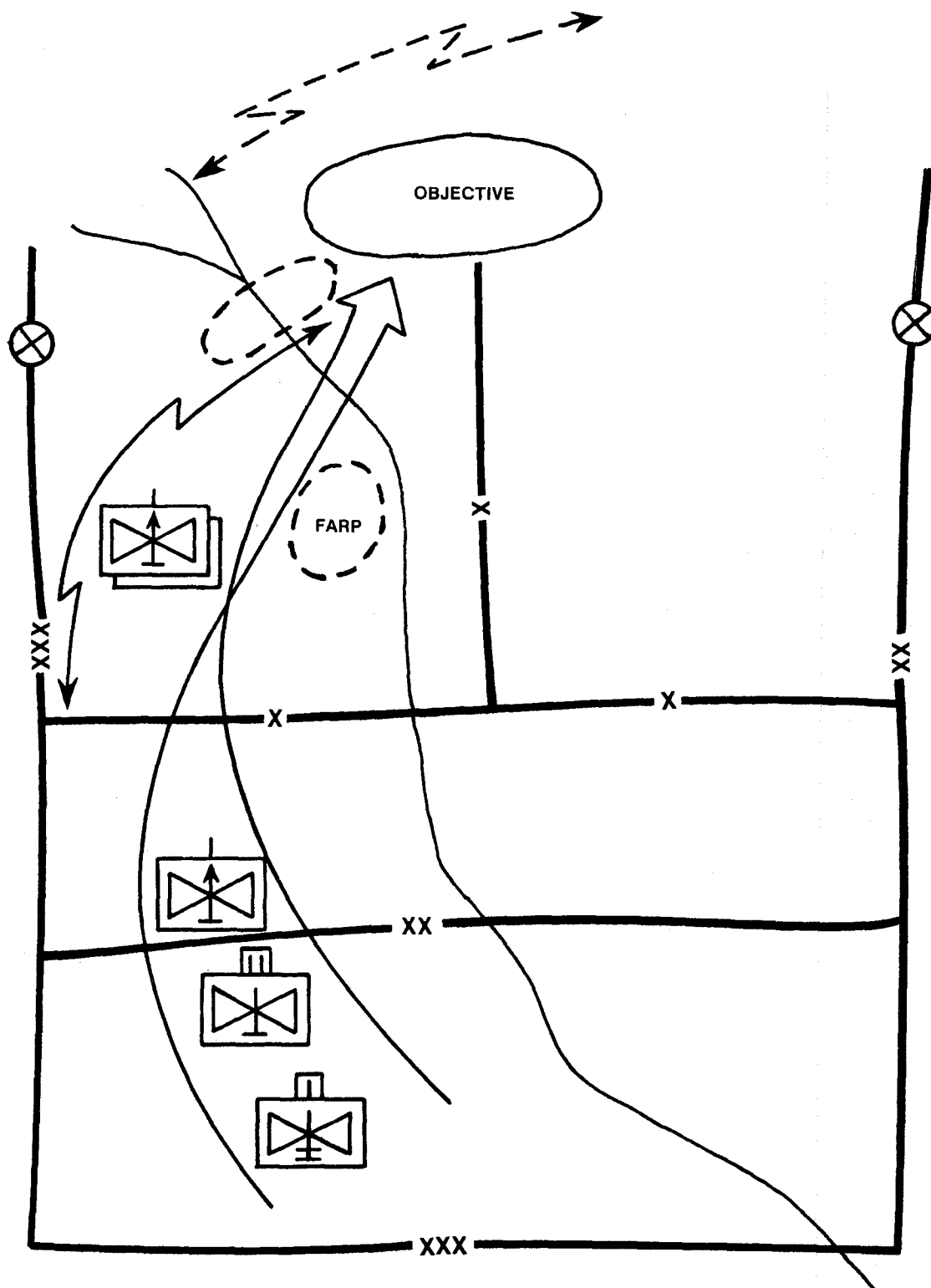


Figure 3-14. Corps aviation brigade units conducting air assault operations with a ground brigade

(4) Air movement. Assault and medium helicopter units move critical personnel, equipment, and supplies for corps units in support of subordinate divisions and directly for subordinate divisions. These helicopter units push critical supplies as far forward as possible for a specified mission or time. Aviation assets in the CS or CSS role often assist COSCOM and possibly DISCOM units during close operations. This assistance will be a primary role for these assets.

3-23. DEEP OPERATIONS

Deep operations must be based on a careful analysis of the enemy's potential to interfere with current and planned operations. Normally, only those enemy forces that threaten friendly operations are relevant. Priority should be given to those targets vulnerable to interdiction that are most critical to the enemy's operations. A thorough IPB and timely intelligence from supporting sources can identify targets that--when destroyed, damaged, or neutralized--will most impede the enemy's ability to concentrate forces, control operations, or support the operation at critical times.

a. The corps aviation brigade will be one of the corps commander's main instruments for projecting combat power in the deep operations area. By timely and aggressive incursions against enemy second-echelon forces, C³ nodes, and critical CSS operations, the corps commander can seize the initiative and create opportunities for offensive exploitation. Whether the corps is in a defensive or an offensive posture, deep operations are continuously planned and executed as a part of the corps scheme of maneuver. Corps aviation forces focus mainly on deep operations during darkness; division aviation forces focus mainly on close operations during daylight.

b. Corps attack helicopter groups and their subordinate battalions attack and wear down enemy counterattack forces. Deep operations for corps aviation assets focus chiefly on reserves or exploitation forces of the first operational echelon; these include independent tank regiments and operational maneuver groups. Corps aviation brigades often operate independently or as a pure aviation force in deep operations. The corps aviation brigade may interdict second- and possibly third-echelon divisions of the first-echelon army or first-echelon elements of the second-echelon army. With corps aviation forces, the corps commander may want to stop the enemy from introducing additional combat and CS forces into the corps area of operations. Specific objectives may include--

- Limiting the enemy's freedom of action.
- Altering the tempo of operations in favor of the division and corps.
- Denying the enemy the ability to concentrate forces.
- Isolating close operations on advantageous terms (set the terms of battle) by reducing the closure rates of uncommitted forces; by preventing introduction of additional combat and CSS forces within an area of operations; and by delaying, disrupting, diverting, or destroying forces and activities within an area of operations.

c. Corps aviation brigades may also conduct air combat operations. With ground maneuver units, assault and medium helicopter units can assist in securing deep objectives. Medium helicopter and command aviation assets also provide CS, CSS, and C³I enhancement.

d. Deep employment requires timely intelligence, effective C², responsive CSS, and combined arms execution. It is characterized by flexibility, speed, surprise, and shock action. Therefore, corps aviation units must have direct access to deep intelligence-gathering sources. During deep operations, the corps aviation brigade conducts missions in support of the commander's overall scheme of maneuver--defensive or offensive. Appendix J provides one scenario showing how corps aviation brigades are employed during deep operations.

(1) Defense. In the defense, deep operations should disrupt the enemy's time-sequencing of follow-on echelons and sever lines of communication. To support the corps defensive scheme of maneuver, aviation brigade forces conduct offensive operations such as attacks by attack helicopter groups. These attacks may disrupt, delay, and destroy enemy follow-on forces and their logistic operations. Corps attack forces often participate in these attacks as part of combined arms operations to seize or destroy critical objectives. Figure 3-15 illustrates a deep attack aimed at destroying an independent tank regiment.

(a) Detailed IPB is critical to this operation. IPB products allow the commander to track the movement of the ITR. Thus he can synchronize the entire effort to deliver the maximum effect on the enemy at the most effective point on the battlefield. Such a point would offer long-range fires for attacking aircraft while constraining the enemy force to the engagement area as shown in Figure 3-16.

(b) Time for detailed planning is essential for deep operations. The main planning consideration is the timing required to catch the independent tank regiment in the engagement area. Intelligence assets must be focused early and sufficient planning performed or the deep operation may be ineffective. Therefore, a reverse-planning sequence is used. It includes--

- Fire-control measures and maneuver within the objective area.
- Routes in and out.
- Passage points and measures needed to suppress enemy AD systems.
- Staging areas, if required.
- Armament loading in the assembly area.

While no set time interval is established for warning, preplanned actions will be more effective than short-notice reactions to enemy initiatives. The key is a close and continuous watch on the battlefield in depth and an accurate assessment of probable enemy actions.

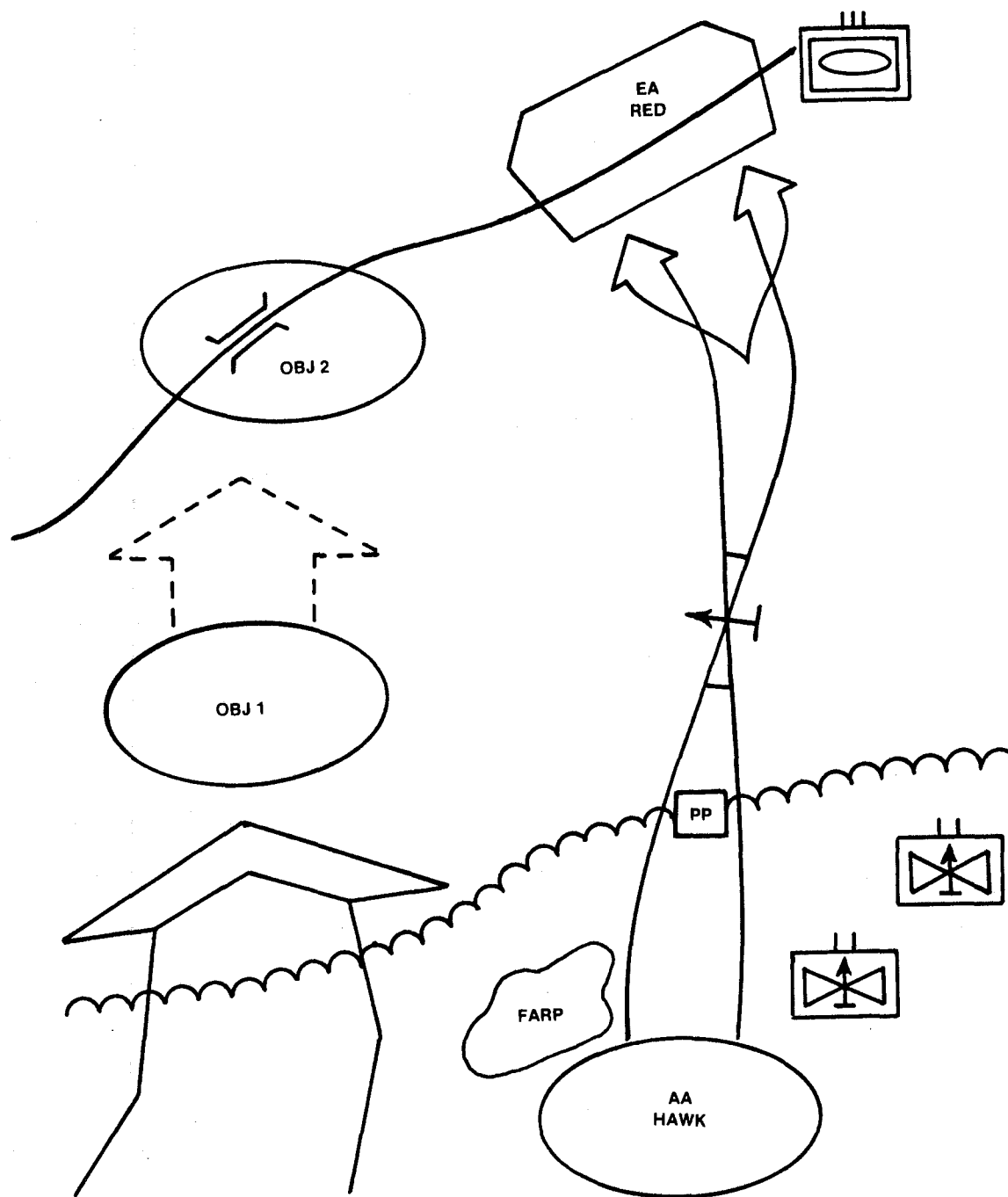


Figure 3-15. Corps aviation brigade forces conducting a deep attack

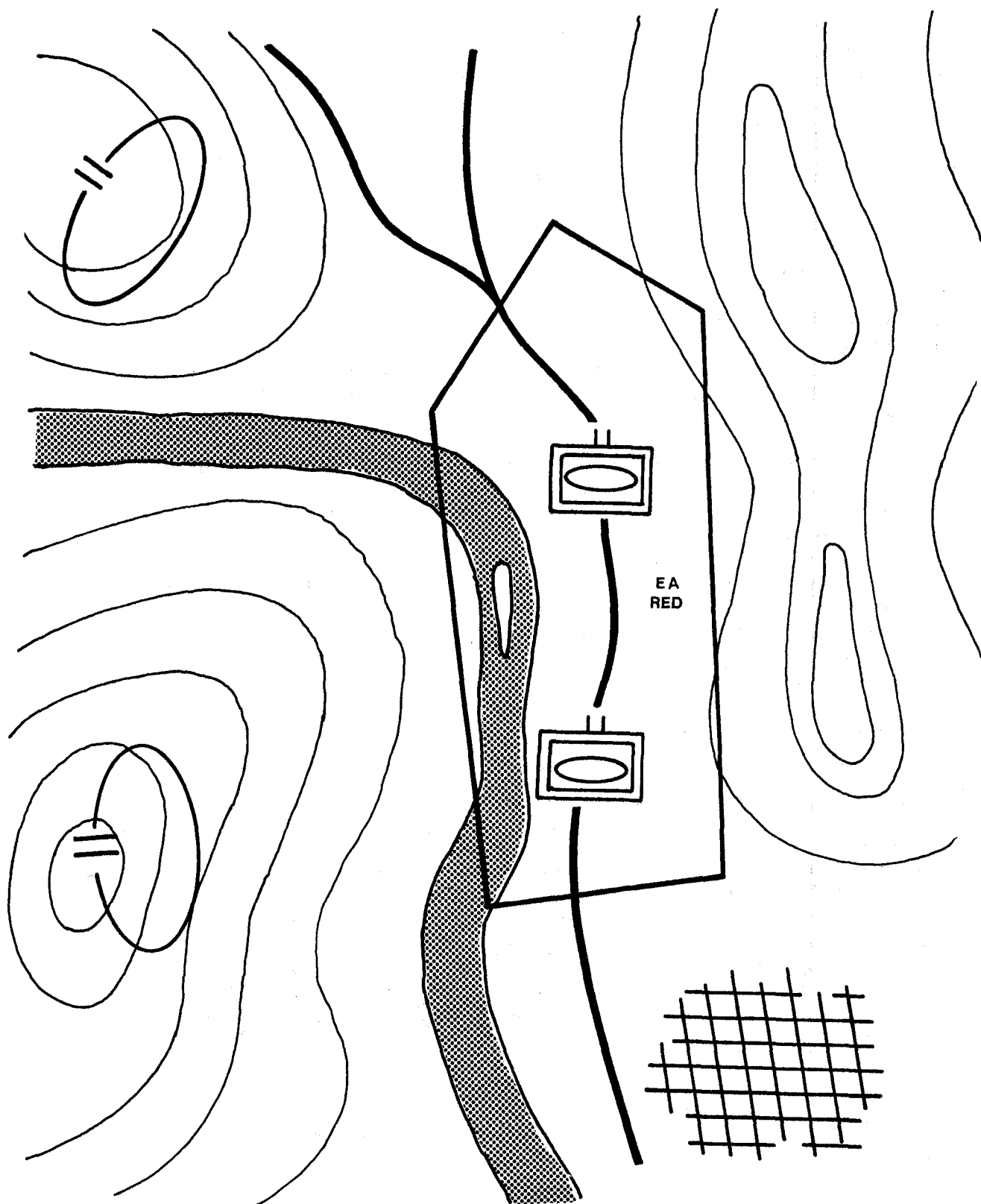


Figure 3-16. Deep engagement area with long-range battle positions and restrictive terrain

(c) Early notification is required to obtain USAF resources for SEAD or objective area operations; thus preplanned sorties are armed and prepared. Considerations in planning flight routes are--

- Ground observation and fire.
- Capabilities to suppress enemy AD systems.
- Ease of navigation.
- Weather conditions along the route.

When enemy helicopters threaten the force, screen operations may be planned and conducted. These screens must be distant enough from the main body of the group to allow time for counteraction or response. Night operations offer more protection to the force; however, they make navigation and adverse weather avoidance more difficult.

(2) Offense. During initial attacks in offensive campaigns, aggressive actions in deep operations--such as destroying tactical reserves, logistic centers, and CS systems--can reinforce success in close operations. Then as the offensive operation develops, deep operation efforts can block withdrawal routes and isolate and weaken forces. During the exploitation and pursuit, constant pressure can be maintained on the enemy. The specific missions of striking forces depend on the situation. Their missions can be classified into three basic types: operations of limited duration, such as raids; operations to secure deep objectives; and operations to continue the attack. In each operation, alternatives may include pure employment of attack assets, employment of attack assets with an AATF, or employment of aviation assets with ground maneuver forces.

(a) Operations of limited duration. Operations of limited duration may resemble raids or ambushes. As in defensive operations, thorough IPB, timely information, and well-coordinated actions to suppress enemy air defenses are essential. Synchronization becomes of even greater importance during offensive actions. The raid or ambush must be carefully woven into the overall corps scheme of maneuver. While the destruction of the enemy force is the primary objective, the operation may also play a part in the corps deception plan. Raids and ambushes can rapidly wear down available enemy counterattack forces, making other friendly operations more successful. Figure 3-17 depicts a raid to destroy a key bridge over which enemy reinforcements could move and defending enemy units could withdraw. Not until the operation is completed and friendly units are withdrawn does the enemy discover the true purpose of the operation. If timed with other actions, the enemy is forced to react and be out of position while the main attack occurs elsewhere. This attack is best delivered during reduced visibility. Such conditions will enhance deception and will increase the protection from enemy fire support aircraft.

(b) Operations to secure deep objectives. Operations to secure deep objectives are deliberate attacks or operations with the goal of occupying terrain in the enemy's rear area. With the advent of air-to-air-equipped

helicopters, these operations may require three-dimensional security. Figure 3-18 depicts the security plan for one such operation. Depending on the location of the nearest enemy helicopter squadron, one of the ATKHBs may be required to focus on that threat. When necessary, weapons may be loaded instead of additional TOW or Hellfire ordnance. These weapons may include air-to-air Stingers, Hydra 70 rockets, and gun ammunition. Cross-loading would still be required to provide some defense against ground systems. These operations will likewise require linkup planning. (Figure 3-19 shows typical linkup fire control measures.) Such a linkup can be accelerated by contact between the attack helicopters and the linkup force.

(c) Operations to continue the attack. These operations exploit successful corps or division offensive campaigns or battles. They prevent the enemy force from reconstituting its defense. These operations can be a single attack or a number of coordinated attacks that seize key choke points and ambush moving enemy armor. When the attack assets of a regiment are orchestrated, the operation can go on for an extended period. Medium and assault helicopter assets control troops and deliver needed supplies and equipment. The sizable resources of the corps aviation brigade can make the greatest contribution to the maneuver tempo and to the pace of the corps. Such an operation must consider the available reserves of the enemy and their ability to interfere with the advance. Resources must be allocated for--

- Screening the main body.
- Attacking moving targets.
- Seizing key choke points and facilities.
- Delivering supplies and equipment.
- Assisting attacking ground maneuver forces when necessary.

Figure 3-20 depicts one such operation. Before such an operation, risks must be thoroughly analyzed and weighed against the potential payoff.

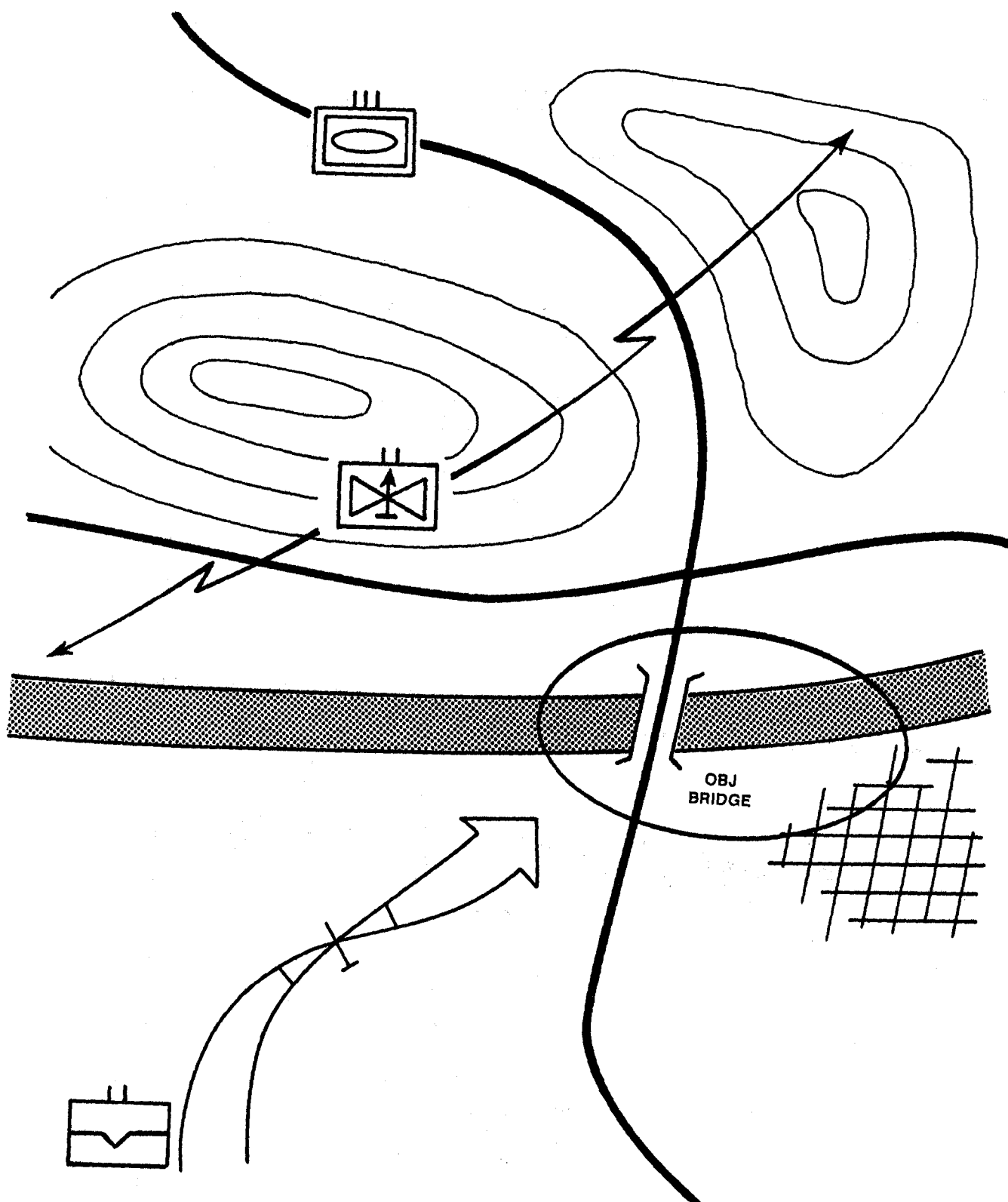


Figure 3-17. Aviation task force seizing a limited-duration objective

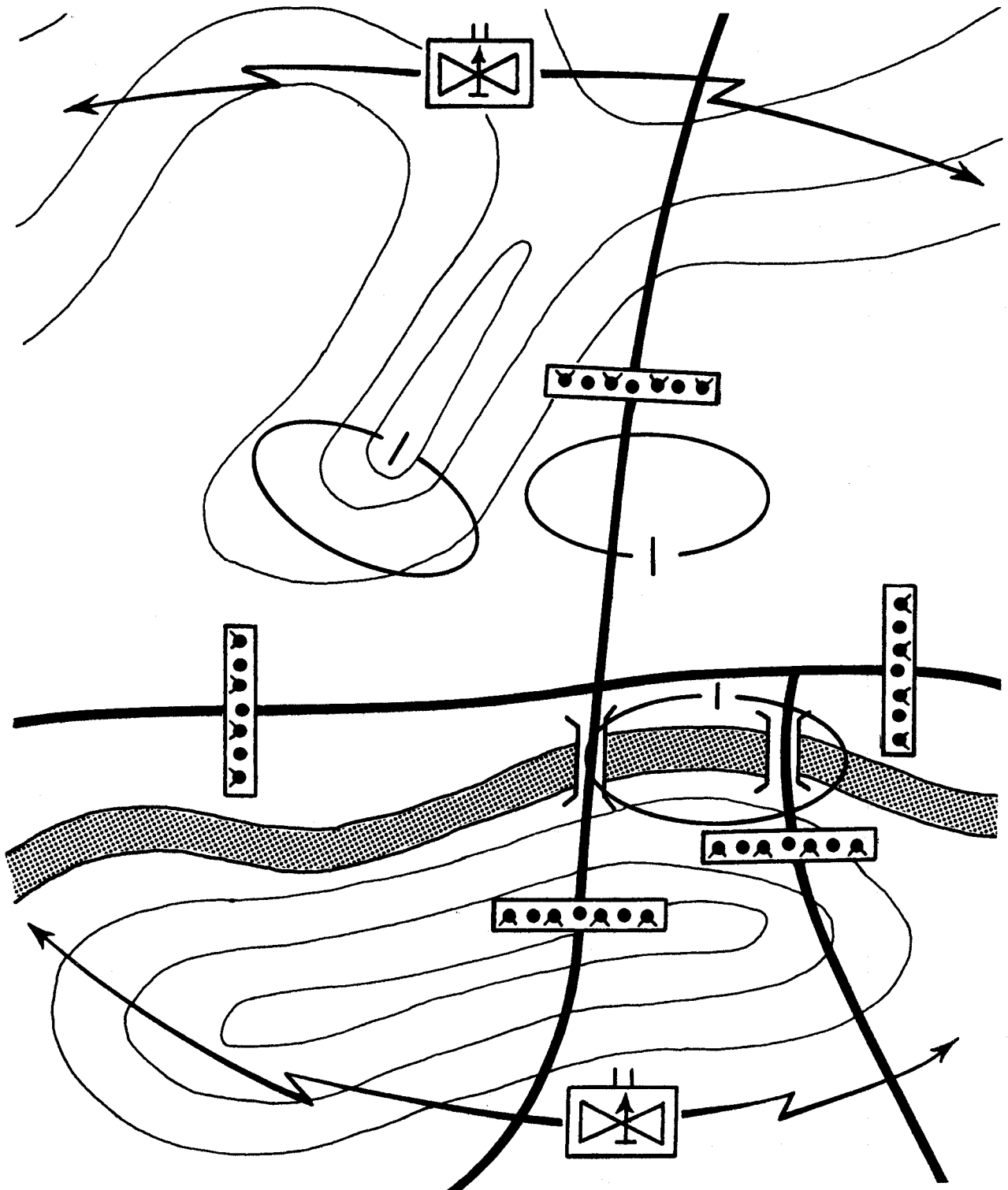


Figure 3-18. Three-dimensional security

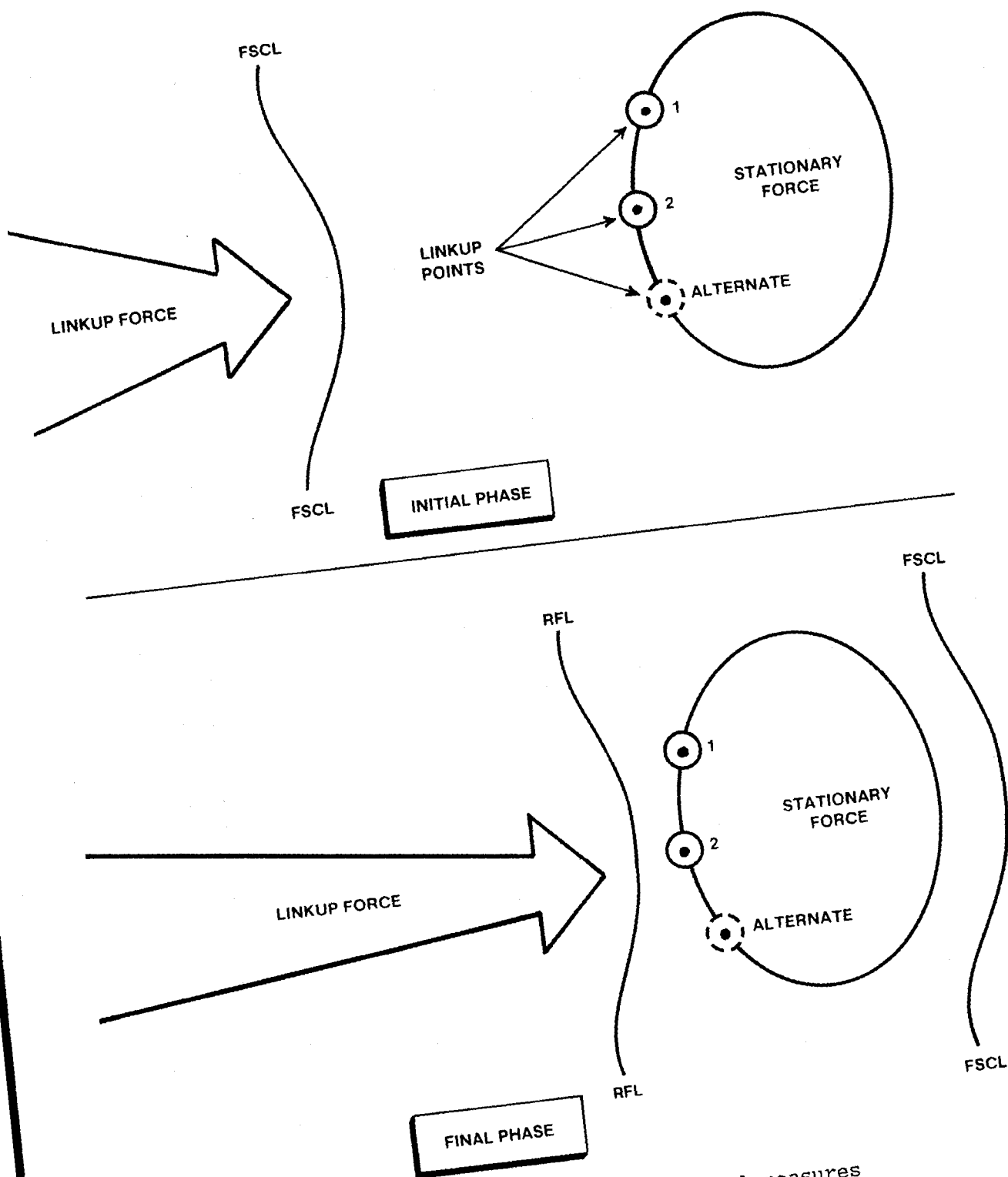


Figure 3-19. Linkup fire control measures

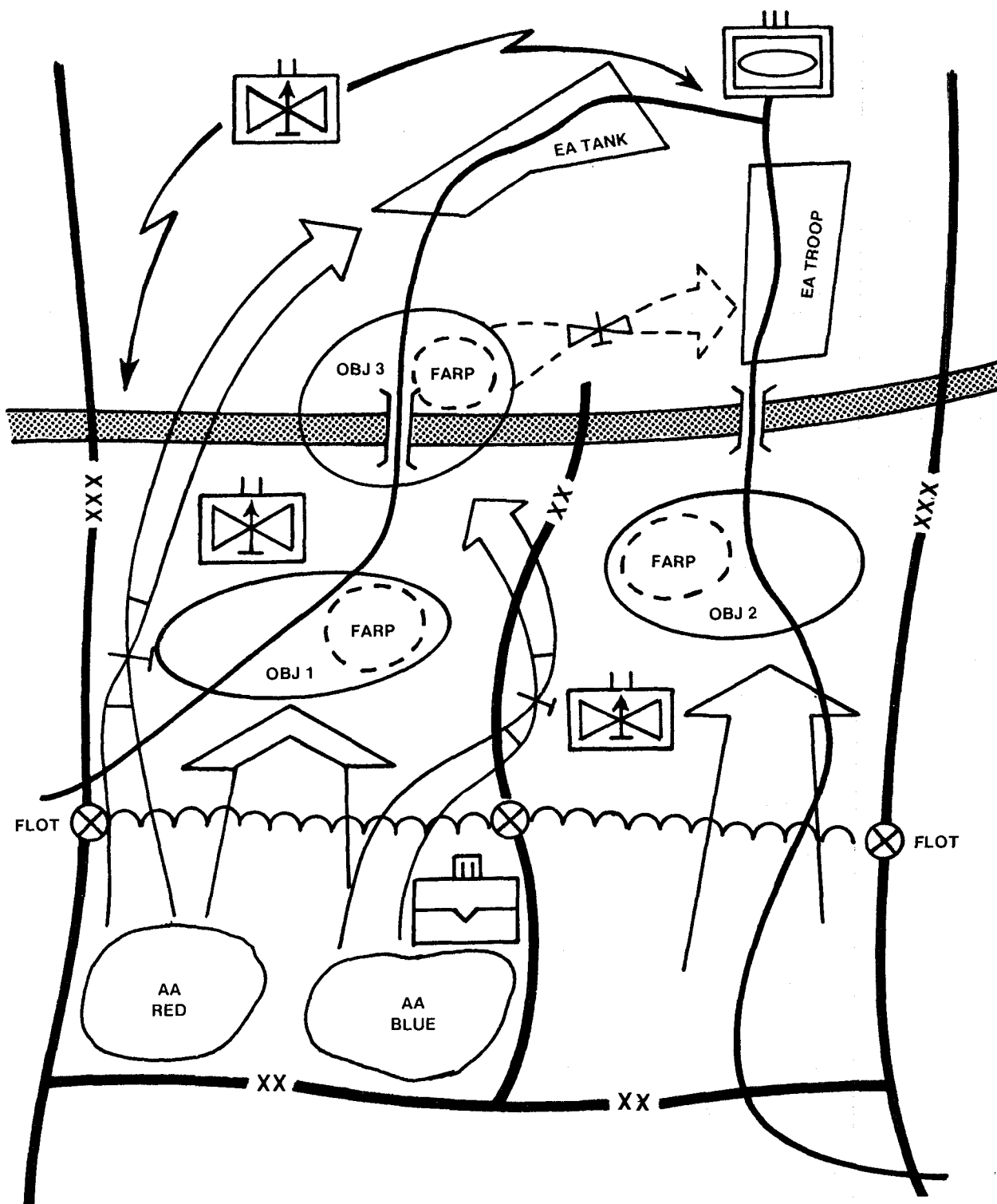


Figure 3-20. Aviation brigade forces continuing the corps attack

3-24. REAR OPERATIONS

As in close operations, the corps aviation brigade coordinates initially for subordinate attack and aviation groups employed in deep operations. However, if the brigade has assigned the mission to a subordinate group headquarters, it also integrates and synchronizes those assets with assigned areas for deep as well as rear operations. In future conflicts, combat operations in the theater, corps, or division rear areas will be an inescapable reality. A major tenet of Threat military doctrine is to disrupt or destroy C², CS, and CSS activities in conjunction with initiatives in close operations. Threat doctrine advocates introducing airborne and heliborne forces to sever lines of communication, destroy logistics centers, disrupt C² functions, and conduct linkup operations with follow-on maneuver units. The objective of these attacks is as much to degrade the potential of friendly forces to reinforce close and deep operations as it is to destroy their objective. The execution speed of Threat attacks into friendly rear areas creates unique challenges for employing responsive firepower without greatly degrading the scheme of maneuver in close and deep operations.

a. Roles in Rear Operations. The corps aviation brigade's roles in rear operations are similar to those of the aviation brigades at EAC. However, there are more attack assets at corps level; therefore, they may assist theater assets or subordinate divisions in their operations to counter rear area threats. The corps aviation brigade or a subordinate element may also serve as the tactical combat force responsible for defeating rear area incursions. Corps aviation brigade assets may also support corps airfield operations.

(1) The corps aviation brigade gives the corps commander a highly mobile and lethal tactical combat force; it can rapidly focus combat power in response to Level III incursions into the corps rear area. Also, the tactical agility of the aviation brigade enables it to quickly disengage and refocus combat power on the main effort once the rear area incursion is diminished or defeated. Thus the corps commander can neutralize or destroy Threat forces while retaining the use of his aviation forces for close and deep operations.

(2) The aviation group is ideally suited for rear operations. It is located in and focused on the corps support area. Therefore, it could be task-organized with appropriate combat assets to respond to Level III threats.

b. Rear Area Command and Control. The corps commander is responsible for corps rear area operations. He normally delegates the authority for this task to a rear area commander. C² for rear area operations is performed from a rear TOC, or RTOC, within the rear CP. All corps units in the rear area are controlled, integrated, and synchronized by the rear CP. Units in the rear area will form base or base cluster defenses. Then the defense of critical nodes of the corps, COSCOM, and C³ facilities are incorporated into base cluster defense plans. FM 100-5 contains further information on corps rear area operations.

c. Rear Area Threat. As a planning guide, the rear operations threat is described by Levels I, II, and III. Defenses are planned and assigned based on these levels; however, the threat levels do not restrict responses. The base defenses and base cluster defenses respond to threat incursions to the best of their organic ability. When the Threat in the rear area exceeds the ability of the response forces, normally MP and base defense forces, the rear CP may employ the tactical combat force. The tactical combat force is a combined arms organization assigned to fight rear operations. The corps commander's listed priority of protection for critical nodes is instrumental in synchronizing the corps rear operations plan. Thus the rear CP can plan and prioritize the entire rear operations effort with respect to the corps commander's intent. FM 100-15 outlines the specific procedures for conducting rear operations at corps level.

d. Task Organization. Rear operations depend on an immediate response. The response force must possess enough firepower and assault forces to either destroy the threat or to contain it until the response force is augmented with additional forces. The aviation brigade gives the corps commander this rapid response force. When designated as the tactical combat force, the aviation brigade or a subordinate unit, ideally the aviation group, may be task-organized with other combat forces to defeat a Level III threat. Figure 3-21 illustrates a possible task organization of the aviation group to conduct rear operations. A task force organized by the brigade is only the initial response force to Level III incursions. If fighting in the rear area becomes protracted, the force is augmented with larger combined arms maneuver forces. As the threat is diminished, elements of the aviation brigade may be released to pursue efforts in close or deep operations areas.

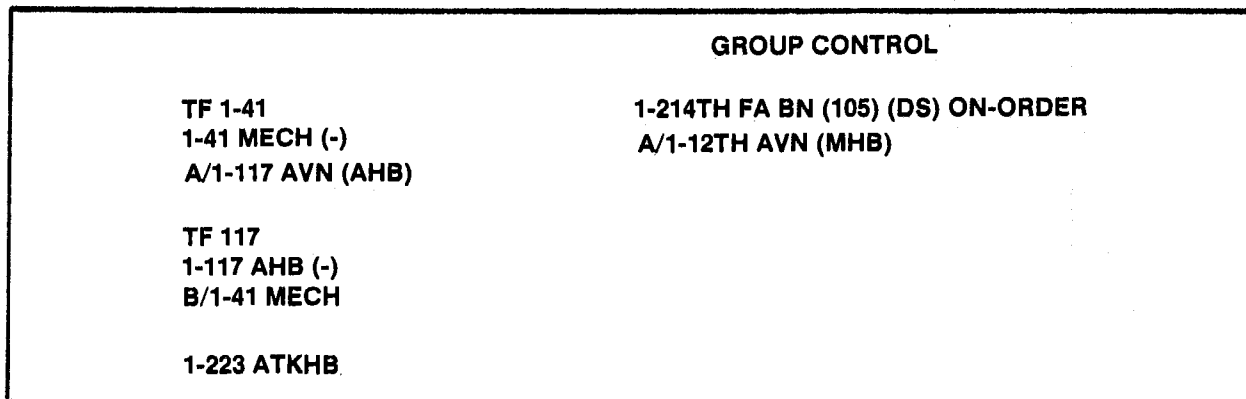


Figure 3-21. Task organization for the 10th Aviation Group rear operations mission

e. Rear Area Planning. To plan rear operations, the aviation brigade must understand the corps commander's priority for protection of the rear area. The brigade must also have the corps rear operations plan. In addition, it must conduct a thorough IPB and establish the C² functions peculiar

to rear operations. The priority of protection list includes all of the critical assets that the corps commander has designated to be secured in the rear area. These assets may include--

- C² facilities.
- Ammunition supply points.
- Class III facilities.
- Corps reserve forces.
- MSRs.
- Bridges.
- Corps support area.

The corps commander will assign the priorities for the protection of these assets. These assets will be placed on a standing list in the order of precedence. Intelligence and AD assets are vital; they must be focused according to the rear operations plan. Also, the corps aviation brigade must coordinate with these assets. It must also maintain communication nets with these assets.

(1) The rear CP publishes the corps rear OPLAN. The OPLAN contains tactical guidance, task organization, and assignment of missions to various elements that are assigned to protect the rear area. This plan normally is transmitted as an annex to the corps OPLAN or OPORD. It contains specific information, such as unit locations and fire support coordination measures, required to develop the aviation brigade staff's OPLAN for rear operations. The corps rear OPLAN allows the aviation brigade and subordinate units to begin preparing for employment in the rear area. For example, attack assets with an on-order rear operations commitment can start reconnoitering BPs and routes to BPs (day, night, NVD) around corps critical assets. Assault helicopter units, with an on-order rear operations mission, can also begin reconnoitering routes (primary NVD-day) while looking for suitable LZs around corps critical assets. Artillery and infantry units should be collocated with their respective assault and medium helicopter units. Coordination with bases or base clusters and AD units is also essential. This planning will help ensure that the employment of aviation units in rear operations is highly responsive.

(2) Fundamental to the aviation brigade's employment in rear operations is an extensive IPB both behind and beyond the FLOT. IPB forward of the FLOT results in fairly accurate predictions of Threat facilities such as airfields, staging areas, FARPs, and troop AAs. IPB behind the FLOT results in fairly accurate predictions of Threat objectives in the corps rear area as well as air and ground avenues of approach to these objectives. The rear CP can develop a corps LZ or PZ denial plan by the rear CP based on LZs identified by the IPB. Aviation assets may also play a vital role in producing or contributing to the IPB. For example, these assets can reconnoiter

possible LZs and routes used by the enemy. The results of the IPB and METT-T are then considered by the aviation brigade when assigning missions and priorities to subordinate units. The IPB at the corps level allows for the allocation of various early warning systems (HUMINT, SIGINT, COMINT, ELINT). This IPB ensures that the corps tactical combat force has enough notice and reaction time to employ its combat forces. With limited aviation assets, other forces--such as AD units--must be integrated to cover suspected avenues of approach, LZs, and likely objectives.

(3) C² of rear operations rests with the corps rear CP. Base clusters and tactical combat forces report to the CP when executing the rear operations plan. To be tied into this C² network, the aviation brigade establishes voice communications with the rear CP. It also sends an LO to assist in aviation planning at the corps level. Once an incursion is detected, the responding force establishes voice communications with the base defense or base cluster targeted by the Threat incursion.

(4) The final stage of rear operations planning for the aviation brigade is the control portion of the C² process. After analyzing the IPB products, the priority of protection, and the corps rear OPLAN, the aviation brigade identifies several decision points or time lines that optimize aviation employment. The rear CP ensures that the appropriate assets (joint acquisition, detection, and intelligence collection assets--both aerial and ground) are concentrated on that area of the battlefield. It also ensures that adequate warning is given to the aviation forces involved in rear operations. Finally, all aspects of planning for rear operations must be coordinated into a realistic and timely alert status (THREATCON); thus the aviation brigade's forces can respond quickly.

f. Execution Methods. Once the incursion, imminent or actual, into the corps rear area has been detected, the actions of the aviation brigade for countering the Threat force fall into three categories. These categories are preemptive attack, attack on the en route Threat force, and attack on a landed Threat force in the corps rear area.

(1) Preemptive attack. The preemptive attack is an effective protection measure against rear area incursions. In a preemptive attack, elements of the aviation brigade will normally cross the FLOT. Then they will conduct deep attacks to destroy enemy aviation forces before they leave the ground. This form of combat is offensive counterair.

(2) Attack on the en route Threat force. The attack on the en route Threat force primarily applies to countering a heliborne or airborne Threat. Orientation of friendly detection systems (SHORAD early warning nets, FAAD, C²I) toward IPB-developed staging areas and air avenues of approach aids in early detection. This early detection helps neutralize or destroy the Threat force in the air. Integration of the aviation brigade's air combat capabilities in this capacity is part of the corps counterair plan; it is referred to as defensive counterair. Also, aviation brigade units (primarily attack helicopter units) employed in the air combat role complement the ground AD effort. They can compel Threat aviation forces to fly evasive maneuvers into

the acquisition and attack envelopes of friendly surface-to-air systems. A²C² helps destroy the Threat force while minimizing the potential hazard of engagement by friendly AD systems.

(3) Attack on a landed Threat force. Attack on a landed Threat force by aviation brigade elements in the corps rear area may be the least desirable employment option. Currently, however, it is the most probable course of action because of the speed with which the enemy can conduct rear area incursions. Employment must be anticipatory; therefore, the aviation brigade's intent should be to destroy Threat forces before they reach the corps rear area. If they are not destroyed, however, Threat forces may be countered by a combination of attack helicopter and air assault actions prescribed in the rear area operations plan. As the brigade's forces develop the situation, additional combat forces are added, as required.

g. Tactical Employment. Figures 3-22 through 3-24 illustrate the tactical employment of a corps aviation brigade in response to a Level III incursion into a corps rear area. The following scenario shows a method of using corps aviation brigade elements. This, however, is not the only method of tactical employment.

(1) The 13th Aviation Brigade (Corps) has been given the mission to provide, on-order, a tactical combat force headquarters containing at least an assault helicopter battalion, an ATKHB, and a medium helicopter company to serve under the control of the corps rear operations commander. These elements are to fight as the combined arms task force when augmented with the additional combat power of infantry and artillery. The 10th Aviation Group task organization, as depicted in Figure 3-21, has been selected to serve as the tactical combat force.

(2) The 10th Aviation Group, in this case, is an optimal organization to use as a TCF headquarters. It is focused on the corps support area. It also has the staff to task-organize and command and control combat assets in the corps rear area.

(3) A Threat heliborne force has been identified en route to a landing zone near the corps main CP (Figure 3-22). In response, the 10th Aviation Group is alerted to execute its on-order mission to counterattack this Level III incursion into the corps rear area.

(4) This synchronized effort begins with the 1-223 Attack Helicopter Battalion. Two of the ATKHB's companies make contact and engage the enemy, in flight, along the eastern boundary of the corps. This attack succeeds in stripping away some of the escort aircraft. The Threat incursion advances to an IPB decision point, triggering the deployment of indirect fire support and air assault assets. The 1-223 ATKHB continues to attack from successive battle positions along the enemy air axis of advance. This action, combined with the effects of friendly air defenses, greatly depletes the enemy; however, it is unable to stop the Threat assault force before it reaches its objective.

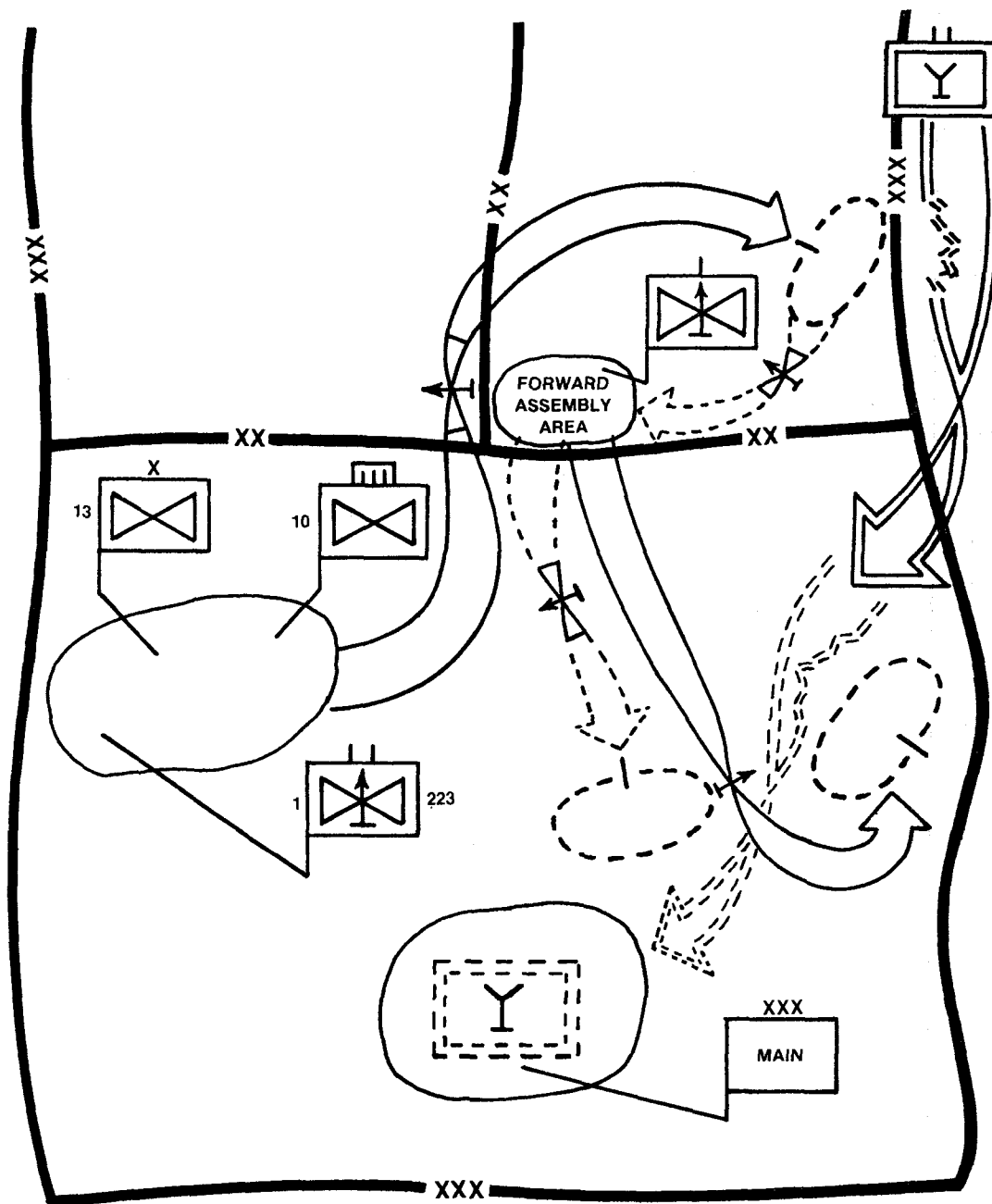


Figure 3-22. Corps aviation brigade, as the TCF, conducting air combat operations as part of corps rear operations

(5) Before the enemy lands into its objective, the 1-223 Attack Helicopter Battalion communicates this information to the 10th Aviation Group commander. The attack helicopter battalion commander then commits his remaining company against the enemy as it attempts to consolidate on the LZ (Figure 3-23). This action isolates the enemy force on the ground and allows

time to maneuver the other attack helicopter companies into their new battle positions. The 1-223 Attack Helicopter Battalion cycles its remaining two attack companies to sustain pressure.

(6) Meanwhile, elements of the medium helicopter company (CH-47) have displaced a battery of the 1-214th FA to positions in range of the enemy. The FA battery provides indirect fire support to the 10th Aviation Task Force. At the same time, the air assault force, consisting of the 1-41st Infantry Battalion (dismounted) and the 1-117th Assault Helicopter Battalion, has established blocking positions around the objective (Figure 3-24). The 1-41st conducts clearing operations with attack helicopters and artillery to complete the destruction of the enemy incursion into the corps rear area.

(7) Throughout the operation, the 10th Aviation Group controls the fight from a tactical CP. This CP is established by C² aircraft from the command aviation battalion.

(8) If this initial response does not defeat or contain the Threat, then additional forces may have to be committed. If the incursion is overwhelming, a larger combined force may be committed. Thus the 10th Aviation Group Task Force can then disengage and respond to other contingencies throughout the corps area of operations.

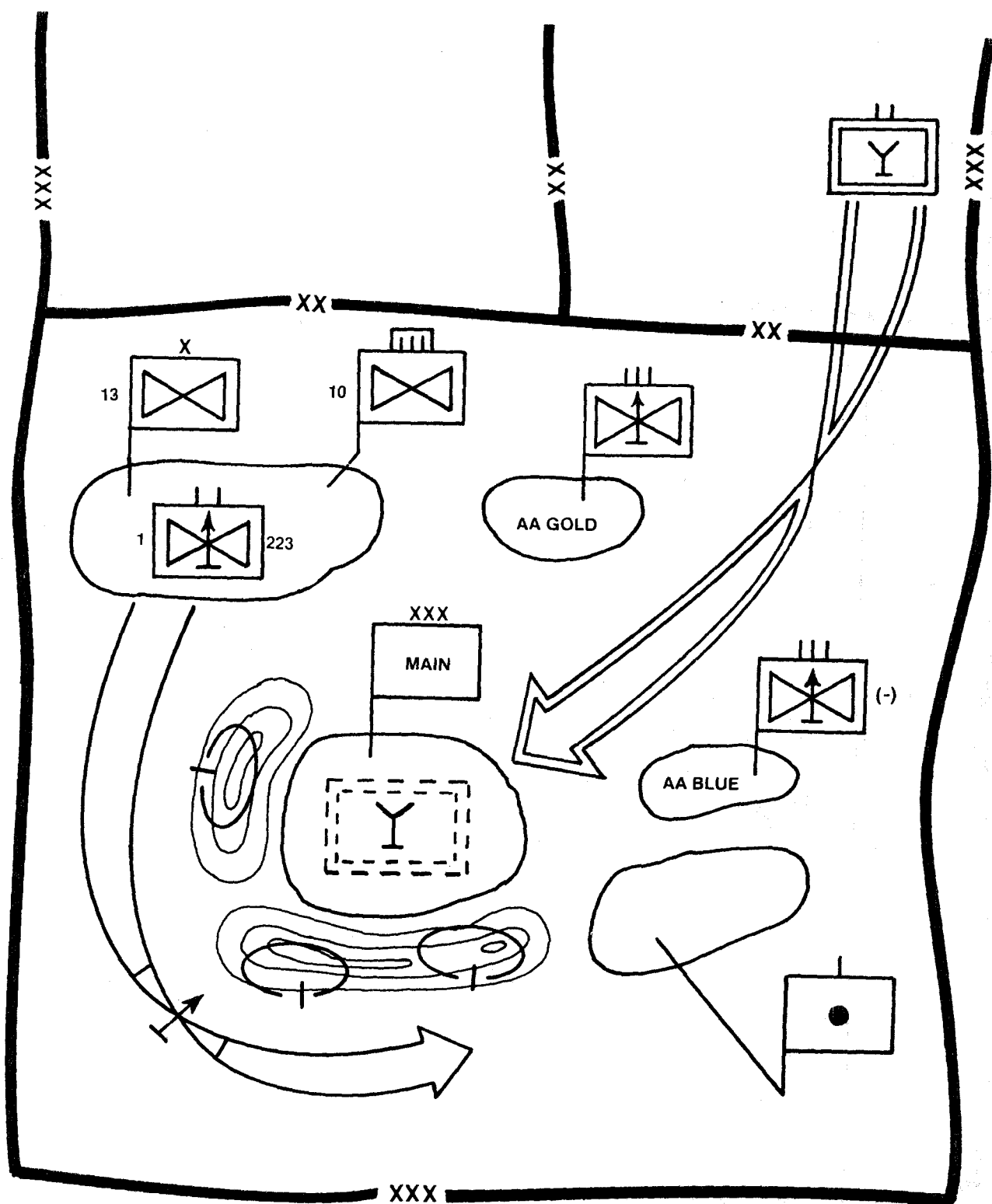


Figure 3-23. 1-223 Attack Helicopter Battalion engaging the Threat during landing zone operations

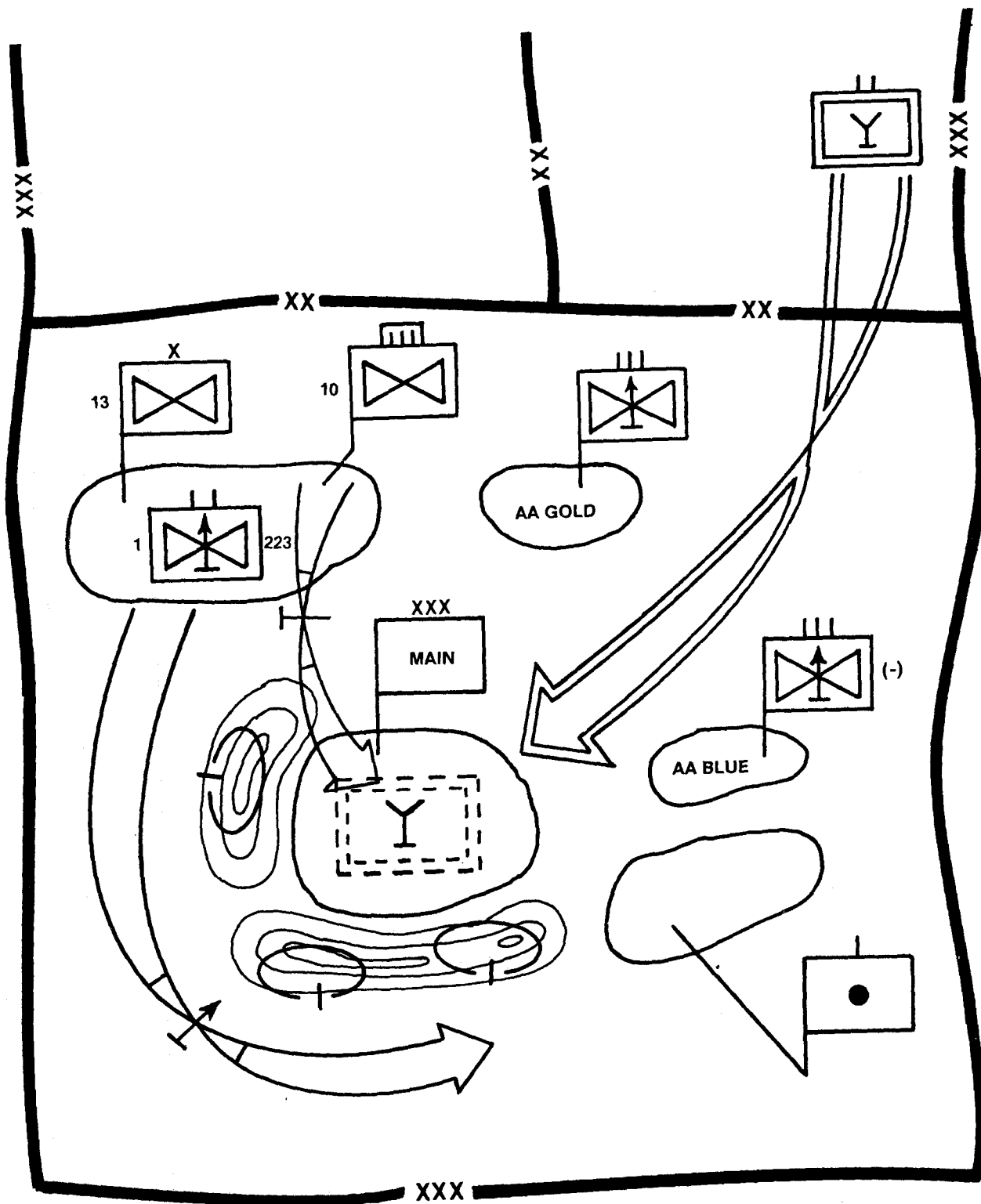


Figure 3-24. The 10th Aviation Group conducting air assault operations in response to a rear area incursion

3-25. CORPS AIRFIELDS

Within the corps rear area, one or more airfields may be required. Normally, the airfields will be a primary and an alternate. An airfield is any area--with or without personnel--designated for takeoffs and landings by fixed-wing aircraft.

a. Participants. Probable users within the combat zone include USAF tactical airlifts and MEDEVAC, as well as Army MI units, command aviation aircraft (fixed-wing), and logistical support units. Engineers may help establish or construct corps airfields and also provide crash rescue. Military police may be employed for security.

(1) Doctrinally, USAF airlifts, during combat operations forward, will support combat forces at any level of conflict on a sustained basis. They will also evacuate casualties from forward of the corps. Operations forward will consist of three categories. First, routine operations will support the corps support area. Second, emergency operations will support division areas. Third, rear operations will support brigades. Airlift support of these contingencies will depend on the availability of US aircraft and the establishment of airfields that can accommodate and handle containerized cargo. Terminal operations for C-130 or C-17 aircraft will require an all-weather, day and night landing capability. They can use unimproved runways of at least 3,000 feet during day operations; however, they require 4,000 feet for night operations. ATS will be provided by ATS units and USAF combat controller teams for the first 72 hours. Afterward, ATS becomes the sole responsibility of Army ATS units.

(2) The MI battalion (aerial exploitation) provides aerial reconnaissance, surveillance, and EW target acquisition support to the corps. The aerial surveillance company has 10 OV-1 aircraft; the aerial EW company has 12 RU-21 or RC-12 aircraft. These aircraft normally operate at corps fully instrumented airfields. An airfield service section provides airfield service support to the battalion. Support includes aircraft fueling and emergency airfield lighting. EW missions require near all-weather, day and night landing capability. The heavy electronics configuration and structural design limit the aircraft to airfields with improved 5,000-foot runways.

(3) The command aviation battalion has five assigned fixed-wing aircraft that enhance C³I functions for corps operations. These aircraft mainly perform utility and command liaison missions. These aircraft must have an all-weather capability; their primary mission is to transport high-ranking military command and staff officials. The aircraft must have an instrumented airfield with an improved 5,000-foot runway.

(4) Logistical support units, such as a COSCOM, may need an airfield to receive bulk supplies or evacuate damaged equipment.

b. Responsibilities. The main purpose of an airfield is to serve fixed-wing aircraft and to support logistical operations for the corps and its subordinate units. If required, corps aviation fixed-wing assets may use an airfield at a USAF installation or a hard surface such as a road or an

expressway. However, the corps commander may direct that a corps Army airfield be established and maintained. Therefore, several corps-level units will establish and maintain the airfield. An airfield commander must be appointed and support assets allocated.

(1) Airfield commander. Within the corps aviation brigade, the corps aviation group commander may serve as the airfield commander or he may direct that the command aviation battalion commander or ATS battalion commander establish and operate the airfield. The corps aviation group may also provide support assets to include a flight operations section for base operations, ATS, and aviation maintenance support.

(2) Construction and crash rescue. Corps engineer units can construct and maintain specified airfield facilities. They also provide crash rescue in support of airfield operations.

(3) Logistics. COSCOM units are directed to provide logistical support of airfield operations; this support primarily includes Classes I, III, and V. Other services provided are transportation and movements control for USAF airlift operations of bulk supplies.

(4) MEDEVAC. Medical units may position corps medical units at the airfield for liaison between Army and USAF medical evacuation forces. Army medical units may also provide medical support for airfield operations on-site.

(5) Security. Military police provide security for corps airfield operations. Other forces, such as infantry or artillery, may augment security operations. Airfield participants may also be responsible for supporting security operations. Host nation support may also be coordinated and used for security.

Section VIII

DIVISION AVIATION BRIGADES

3-26. EMPLOYMENT

Division aviation brigades provide an unprecedented capability to the division commander as a land component force on the modern battlefield. They are organized and equipped to provide unity of command over divisional aviation brigade assets. The speed and agility of aviation forces allow them to be highly responsive across the entire division battlefield.

a. During close, deep, and rear operations, the division aviation brigade expands the potential of traditional forms of offensive and defensive maneuver. With ground maneuver forces, highly mobile aviation forces

allow the division commander to extend the breadth and depth of the battle. During offensive operations, these aviation forces can--

- Destroy enemy reserves, C², CS, and CSS during close and deep operations.
- Envelop the flanks and rear of enemy ground forces.
- Isolate and destroy uncommitted enemy reserves and blunt enemy counterattacks.
- Destroy bypassed enemy units and deny enemy incursions in the rear area during offensive operations.

b. Integrating the combat power of aviation and general forces is extremely important. Forces in combined arms operations complement each other's capabilities. Aviation and ground forces do not always attack along the same axis or have identical objectives. Normally, it is better to force the enemy to fight in more than one direction. The key is to plan operations that capitalize on synchronizing the combat power of all elements to maintain constant pressure on the enemy. Whether in deep, close, or rear operations, the division aviation brigade plays a key role during offensive operations. It performs several functions as discussed below.

(1) Movement to contact. During a movement to contact, the aviation brigade can simultaneously execute several missions to support division operations. In some cases, it may be designated as the controlling headquarters for either the covering force or the advance guard. When supporting the division's scheme of maneuver during a movement to contact, the brigade employs its subordinate assets to enhance and extend division capabilities. The cavalry squadron often participates in the covering force. At the same time, the ATKHBs are positioned in forward AAs as a tactical reserve; they will react to enemy contact initiated by the squadron or the division's advance guard. Also, the assault helicopter company helps displace FARPs forward. It is prepared to accept on-order missions to conduct air assault operations. As the controlling headquarters for the covering force or the advance guard, the aviation brigade should be augmented with additional ground maneuver forces. The brigade can receive CS assets in direct support.

(2) Hasty attacks. Aviation brigade elements often participate in hasty attacks to support division operations. The brigade may conduct hasty attacks while augmented with ground maneuver forces; or it may execute missions with organic assets. In this role, the brigade is most often employed to prevent the enemy from reinforcing the division's objectives, to blunt counterattacks, or to exploit friendly success. The headquarters of the aviation brigade, when used as a task-organized force, is well suited to control forward maneuver efforts of the division. When the covering force makes contact with moving enemy forces, attack helicopter units attack the enemy formations. At the same time, the brigade's added ground task forces deploy to develop the situation.

(3) Deliberate attacks. The aviation brigade participates in deliberate attack missions in deep or close operations areas. The roles of aviation brigade units during a deliberate attack differ little from those during a hasty attack. The main difference is the amount of planning, coordination, and preparation that takes place before the attack. During deliberate attack operations, the cavalry squadron conducts reconnaissance operations and provides security for the attacking force. The ATKHBs then envelop enemy forces and strike moving enemy reserve formations; at the same time, ground maneuver forces assault and break through the more heavily fortified positions. Other roles for attack assets may include destroying CPs, neutralizing artillery, and preventing the escape of targeted units. The assault helicopter company may also be task-organized with the infantry to conduct air assaults by blocking enemy withdrawal routes or securing deep operation objectives.

(4) Exploitation. The aviation brigade is an ideal exploitation force; it is well suited to the fast tempo of this operation. It can easily maneuver to outflank or cut off enemy forces, fixing them so that they can be destroyed. During an exploitation, the brigade will capitalize on early success, maintaining the momentum of the operation and keeping the enemy off balance. It must exert continuous pressure against enemy forces to prevent them from reorganizing and especially from reinforcing their defenses. Destroying C² facilities, cutting lines of communication, and destroying the enemy's logistical capability will be primary aviation missions.

(5) Pursuit. The aviation brigade plays a major role in the pursuit. As part of the direct pressure force, it provides security, locates enemy forces, and attacks to destroy the enemy. As part of the encircling force, the brigade can envelop the retreating enemy and further delay, disrupt, and destroy its forces.

c. ~~Other aviation brigade offensive missions include special-purpose operations. Reconnaissance in force, raids, and deception operations (feints and demonstrations) are examples of special-purpose operations.~~

d. The aviation brigade enables the division commander to retain the offensive spirit by exploiting windows of opportunity created by his successful defensive efforts. The aviation brigade can--

- React quickly to foil enemy efforts during rear operations.
- Strike enemy forces in depth where and when they least expect it.
- Concentrate forces rapidly, moving substantial combat power across the battlefield.
- Retain flexibility by simultaneously planning many different missions and executing each on order.
- Seize the initiative with a responsive counterattack force that possesses a distinct maneuver advantage over enemy armored formations.

e. As in offensive operations, the aviation brigade commander must completely understand the overall intent of the division and corps commanders in defense operations. The brigade commander ensures that subordinate leaders also comprehend the intent. Thus they can capitalize on fleeting opportunities in the defense.

f. Coordinated employment of aviation and ground maneuver forces is critical in defensive operations. Commanders must employ aviation and ground units in complementary roles that enhance the capabilities of both units. Aviation assets provide tremendous flexibility and maneuver speed. However, only ground forces can hold terrain or close with the enemy. Aviation attack assets should concentrate on engaging moving enemy formations. They can operate independently to move and destroy enemy formations before they can be committed. They can also attack the enemy along with ground fires. Attack helicopters are most effective when employed against the flanks or rear of enemy attack formations. Therefore, they are employed in depth on the battlefield; that is, during deep, close, and rear operations.

3-27. CLOSE OPERATIONS

The division aviation brigade serves the division commander in the division's close operations as an immediate response. It exploits uncovered weaknesses and compensates for any friendly failures that occur in the division's close area of operations.

a. Aviation assets perform several functions at the division, to include--

- Reacting to enemy contact initiated by the covering or guard force.
- Screening the division's flanks.
- Maneuvering to blunt enemy counterattacks and to envelop enemy forces using attack and air assault forces.
- Conducting air movement operations to move personnel, equipment, and supplies to support the scheme of maneuver with assault helicopter assets.
- Acting as controlling headquarters for the covering force or guard operations (when required).
- Conducting air combat operations.
- Enhancing C³I and augmenting aviation assets in support of maneuver, CS, and CSS using command aviation assets.

b. During the division's close operations, aviation brigades participate in offensive and defensive operations. They may be employed as a security force in the security area or the main battle area. They may also be employed as a separate maneuver force in a role such as the division reserve.

The division aviation brigade often participates in close operations during daylight; at the same time, the corps aviation brigade may focus mainly on deep operations during darkness.

3-28. COVERING FORCE OPERATIONS DURING DEFENSIVE OPERATIONS

The aviation brigade provides the division commander with new options for determining the best allocation of resources for the covering force mission. He may augment the covering force with assets from the brigade; for example, cavalry and air reconnaissance squadrons or ATKHBs. In this case, an attached or OPCON relationship is appropriate to share the burden of supporting these elements for the duration of the covering force battle. The brigade commander may use assets from the assault helicopter company to transport engineer barrier material forward. He may also position FARPs to support brigade units in the security area. After the covering force passes, he plans and coordinates actions to refit these units for future missions. If the division has to constitute its own covering force, the brigade headquarters can plan and control the covering force battle. If the aviation brigade commander is assigned the covering force mission, the other ground brigades will be free for detailed preparation of the MBA. In this situation, the division commander task-organizes the aviation brigade with additional ground maneuver and CS assets. Covering force operations are conducted during offensive and defensive operations. This paragraph addresses defensive covering force operations; offensive covering force operations are described in paragraph 3-29.

a. Aviation Brigade as the Covering Force Headquarters. When designated as the covering force, the aviation brigade must have adequate ground maneuver forces and CS and CSS assets to achieve the full effect of the combined arms team. Aviation brigades in light divisions are more likely to serve as a covering force headquarters than those in heavy divisions. The strength of the covering force will depend on the size of the security area and the intensity with which the division commander wants to fight the battle. It will also be based on the number of other contingencies for which the division must prepare.

(1) Figure 3-25 shows an example of task organization for a covering force mission. This example depicts a covering force for the air assault division. Here, the aviation brigade is augmented with two air assault battalions and an appropriate mix of CS assets. The air assault battalions are task-organized according to the commander's concept of the operation and METT-T. Similar considerations are applied to the distribution of CS assets. This example also indicates that two of the brigade's organic attack helicopter battalions are being retained under division control for contingencies in deep or rear operations.

(2) The aviation brigade commander must ensure that adequate CSS elements are available to sustain and maintain the force. A logistics composite support unit may be configured to support covering force operations. The LCSU includes assets from the DISCOM, COSCOM, and appropriate forward service support elements or mobile support teams and the parent unit that accompany ground maneuver units augmenting the covering force. Initially,

this unit would locate close to the FEBA, perhaps to the rear of the forward MBA positions, to provide responsive support. These support elements or units may include service and supply, maintenance (air and ground), and medical support elements.

<u>TF 1-324 (AASLT)</u>	<u>BRIGADE CONTROL</u>
1-324 IN	1-102 AVN (AHB)
2/A/1-541 AIR DEFENSE (DS)	2-102 AVN (CAC)
2/C/354 ENGINEER (DS)	3-102 AVN (MHB)
	2-14TH FA (105, TOWED) (DS)
<u>TF 3-554 (AASLT)</u>	1-19TH FA (155, TOWED) (GS)
3-554 IN	A/1-541 AIR DEFENSE (-) (DS)
1/A/1-541 AIR DEFENSE (DS)	C/354 ENGINEER (-) (DS)
3/C/354 ENGINEER (DS)	1/B/321ST MI BN (DS)
	1/329 NBC DEF CO (DS)
<u>2-19TH ARS</u>	FSSE, DISCOM (DS)
<u>1-227TH ATKHB</u>	
<u>3-227TH ATKHB</u>	

Figure 3-25. Task organization for covering force mission

(3) The aviation brigade commander and staff provide timely command and control during the covering force battle. This C² will be assisted by clear and concise mission guidance, battlefield control measures, FRAGOs, and responsive communications. To maintain communications with forward elements in the covering force, the headquarters normally establishes radio relays. CPs are usually echeloned with a main CP positioned to the rear of the security area and a tactical CP positioned for optimal control of the battle. The tactical CP is composed of ground vehicles or aircraft.

b. Ground Task Force Roles. The covering force commander usually task-organizes ground maneuver battalions. His decision is based on his concept of the operation and METT-T. Task forces are integrated into the maneuver scheme with aviation and reconnaissance assets to fix and destroy enemy forces. When operating in the covering force, ground maneuver battalions echelon their trains. The location and composition depend on METT-T. The same support precepts apply as for other operations. Normally, field trains are located to the rear of the security area while combat trains may be located well forward, depending on METT-T. Ground maneuver forces are given missions to delay, defend, and counterattack.

(1) Task forces cause delays to trade space for time. Delays can also draw the attacker into positions that expose the enemy's flank or rear units to counterattack. Successful delay operations mainly slow the enemy's advance to gain time. Their secondary role is to destroy as much of the enemy force as possible yet preserve the freedom of maneuver. These tasks are accomplished by forcing enemy forces to deploy and react to successive engagements without allowing them to achieve decisive results. Such actions are costly to the enemy in time and attrition of combat power. Figure 3-26 depicts how ground maneuver units conduct delays.

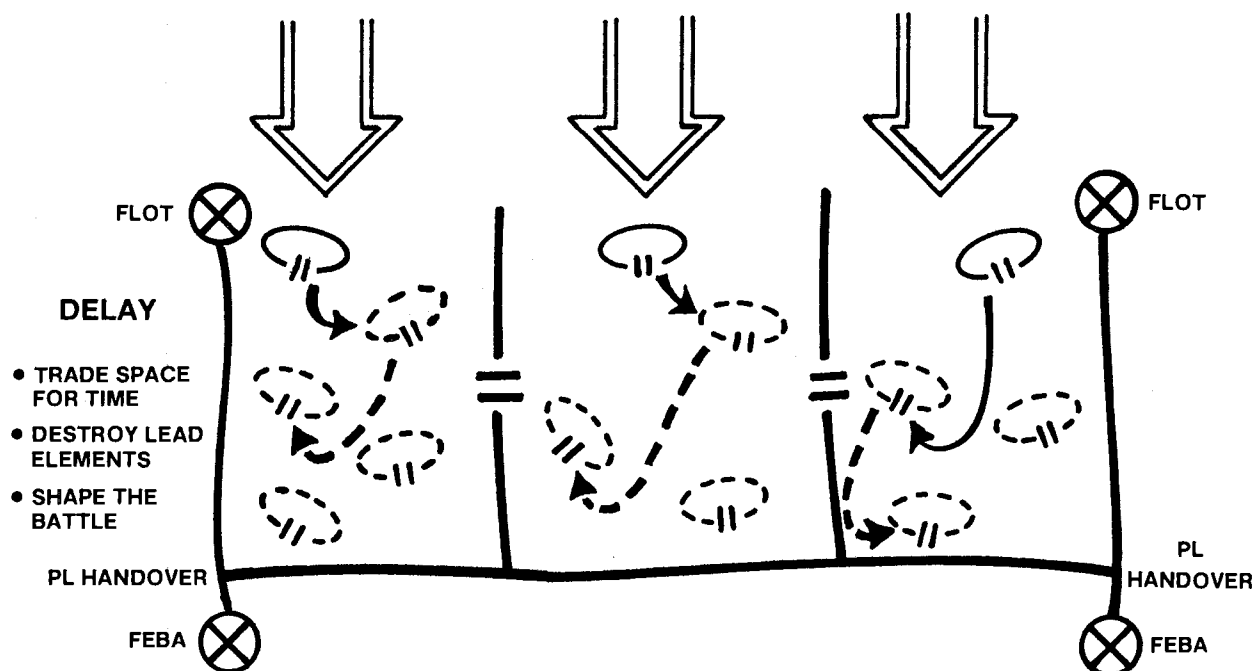


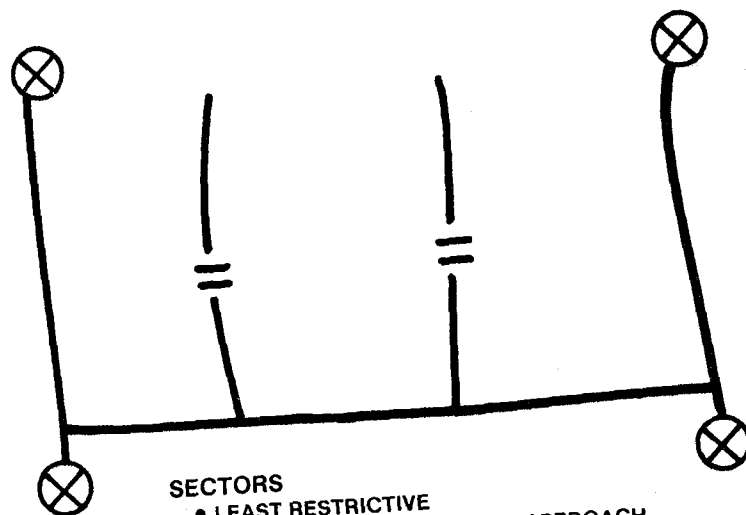
Figure 3-26. Ground maneuver units conducting a delay during covering force operations

(2) During covering force battles, task forces may defend to retain key terrain or to deny or canalize enemy movement along a specific avenue of approach. They also defend to stop the enemy in engagement areas that foster counterattacks. Task forces may defend in sector or from BPs or both. In some operations using the economy-of-force principle of war or when portions of the security area are more defensible than others, the commander may employ a combination of sectors and battle positions. Figure 3-27 illustrates the options for the disposition of forces in the defense.

(a) Sectors are designated along the most defensible terrain astride enemy avenues of approach. They clearly define areas for which a TF commander is responsible. Because sectors are less restrictive than designated BPs, the TF commander selects battle positions or sectors for company teams. When sectors are established, the movement of individual task forces can be monitored by imposing phase lines as control measures.

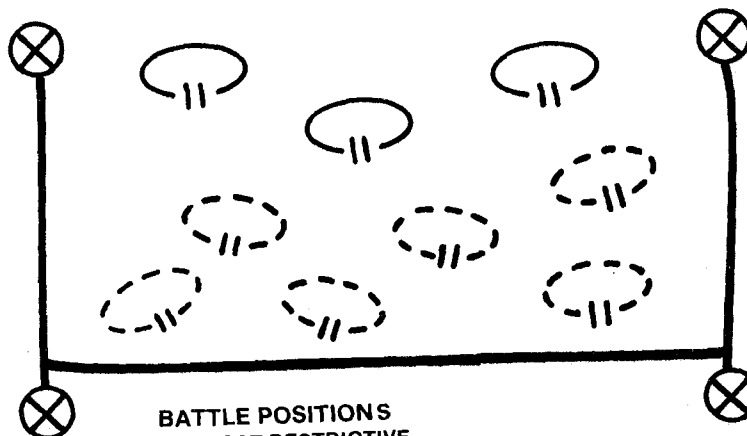
(b) When the security area is clearly dominated by key terrain features, it may be better to designate task force BPs. In this instance, the covering force commander first identifies likely enemy avenues of approach; then he selects engagement areas and battle positions throughout the security area on terrain that dominates those avenues. Thus he is able to control the battle by having the TFs occupy the BPs and delay, defend, or attack from them.

DEFEND



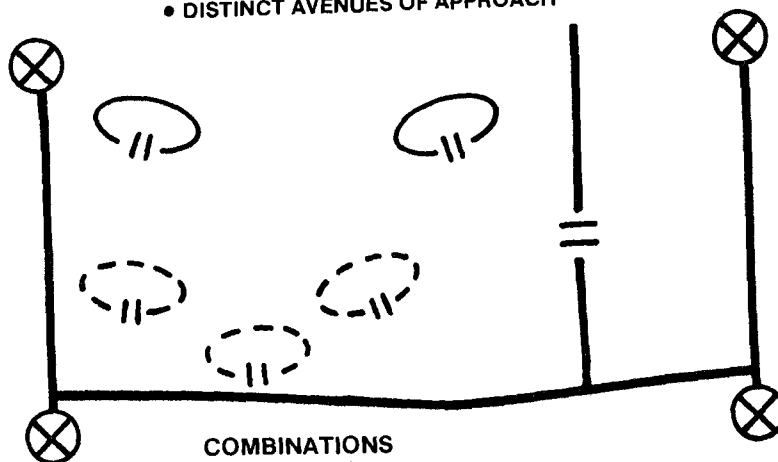
SECTORS

- LEAST RESTRICTIVE
- LESS DISTINCT AVENUES OF APPROACH



BATTLE POSITIONS

- MOST RESTRICTIVE
- DOMINANT TERRAIN
- DISTINCT AVENUES OF APPROACH



COMBINATIONS

- MIXED TERRAIN
- DIFFICULT TO CONTROL

Figure 3-27. Disposition of forces in the defense

(3) To seize the initiative, the covering force commander plans and conducts counterattacks when opportunities occur. His aggressive action stalls the momentum of the attack and forces the enemy to continually react to the unexpected. Counterattacks may be oriented on destroying enemy forces or on seizing key terrain. Local counterattacks must be executed rapidly. The division commander supports his covering force operations with battle-field interdiction or deep attacks to delay and disrupt follow-on forces; at the same time, a local counterattack is conducted against first-echelon elements. Counterattacks may be conducted by positioning units to neutralize enemy forces by fire or by maneuvering units against the enemy's flanks or rear units. The aim is to sever lines of communication and to envelop the force. Figure 3-28 illustrates the possibilities for local counterattacks when ground maneuver forces are employed with aviation assets.

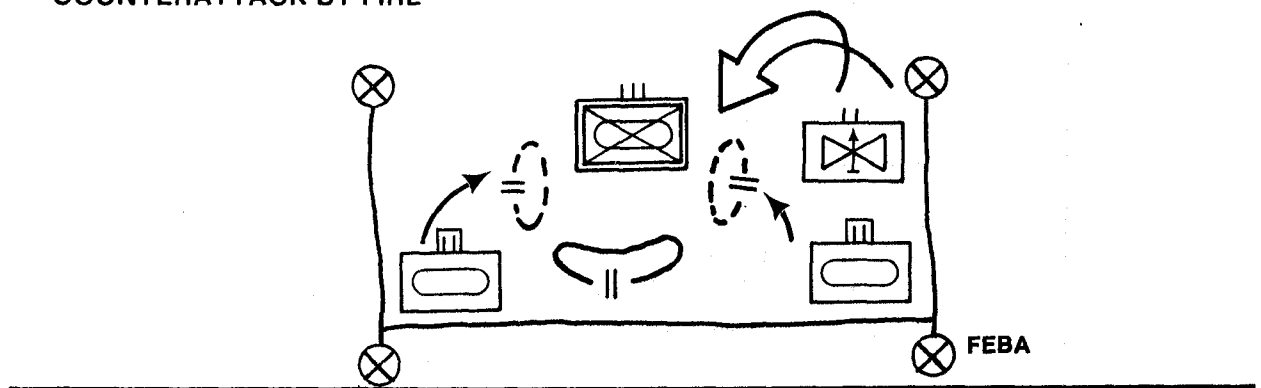
c. Aviation Brigade Roles. As the controlling headquarters, the aviation brigade commander normally employs all subordinate units during covering force operations. Likewise, when the brigade is not the covering force headquarters, most of the brigade will be employed by the controlling headquarters.

(1) Cavalry and air reconnaissance squadron roles. During covering force operations, cavalry and air reconnaissance forces perform reconnaissance and screening. They may also participate in guard operations as described in FMs 1-117 and 17-95.

(2) ATKHB roles. The attack helicopter battalion is one of the primary tools with which the covering force commander retains the offensive spirit. As implied by its name, the mission of the ATKHB is to attack. With its maneuver speed, it responds quickly to contingencies throughout the security area. ATKHBs are normally employed from forward AAs or attack positions in the rear of the security area. This rear location affords limited protection from enemy indirect fires and provides responsiveness throughout the security area.

(a) Under most conditions, attack helicopter units should not be employed below battalion level. Attack helicopter companies do not have the resources to recycle elements for sustained engagements between the FARP and the area of operations. The ATKHB, however, can accommodate different mission profiles as depicted in Figure 3-29. It may employ its attack companies in three modes: maximum destruction, phased employment, or continuous attack. FM 1-112 contains more detail on the employment of attack helicopter units.

COUNTERATTACK BY FIRE



COUNTERATTACK BY MANEUVER

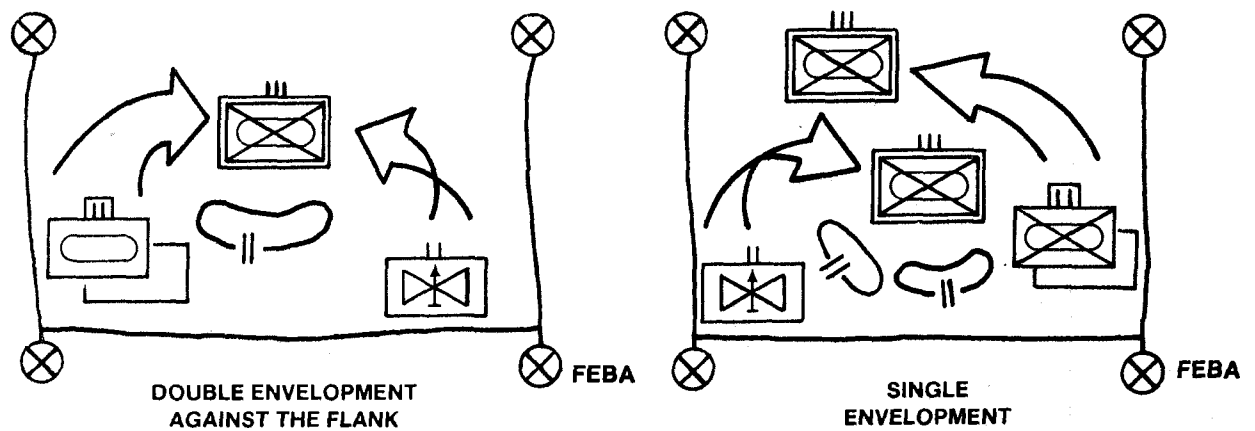
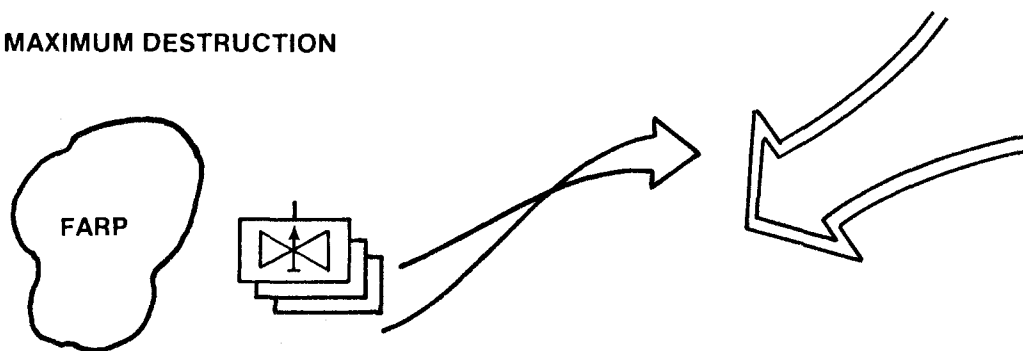
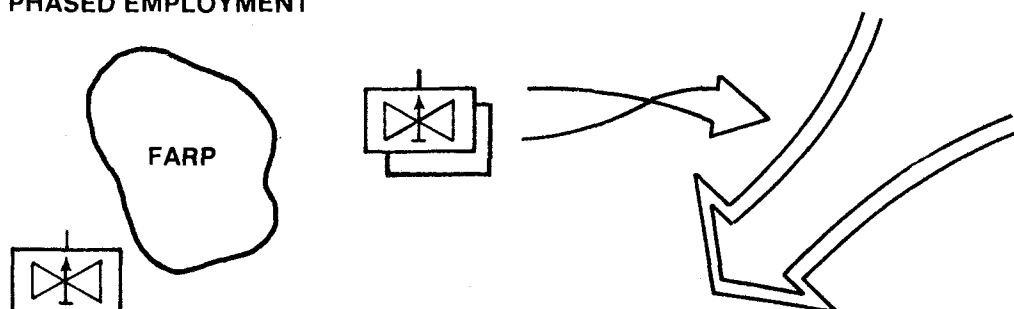


Figure 3-28. Local counterattacks in the security area

MAXIMUM DESTRUCTION



PHASED EMPLOYMENT



CONTINUOUS ATTACK

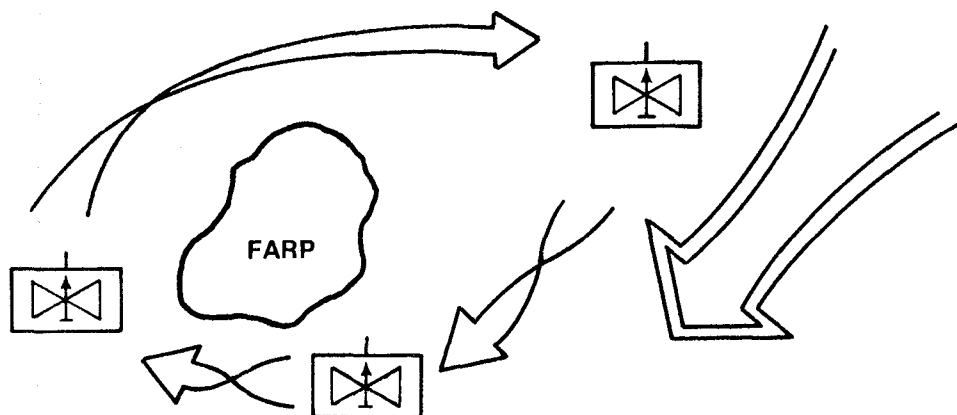


Figure 3-29. Employment of the attack helicopter battalion in the security area

(b) One of the precepts of AirLand Battle doctrine is to fight as a combined arms force by synchronizing all available maneuver and fire support assets. Commanders must ensure that coordination between aviation and ground units is continuous and detailed. This coordination precludes any possibility of being misunderstood or becoming disconnected during the battle. Figure 3-30 lists some key requirements that must be coordinated among subordinate units to promote battlefield control.

GENERAL

- Established liaison.
- Detailed premission planning.
- Joint reconnaissance.
- Contingency planning.

BATTLEFIELD

- Complementary initial and subsequent battle and attack positions.
- Fire distribution guidelines.
- Established target priorities.
- Locations of ground maneuver, FA, and air defense units.
- Fire support priorities.
- Fire support and obstacle overlays.
- Maneuver scheme.
- Coordination for movement and fires across sector boundaries.
- Battlefield control measures.
- Attack and displacement signals.
- Airspace command and control.
- Use of laser designation systems.
- Common radio frequencies and SOI.
- Locations and methods for on-the-spot mission updates.

Figure 3-30. Required coordination between aviation and ground units

(c) Attack helicopter units have numerous roles in covering force operations. They may be employed independent of ground maneuver units in deep attacks and against enemy second-echelon forces in JAAT operations. They may also be integrated with the ground maneuver units during delay, defensive, and counterattack operations.

(d) To disrupt the enemy's attack schedule, the covering force commander often conducts simultaneous actions against first-echelon and follow-on enemy forces. The ATKHB can weaken, disrupt, and delay enemy second-echelon regiments while other units destroy the first echelon as illustrated in Figure 3-31. Actions against the second echelon are risky; when successful, however, they pay off in tremendous dividends. Such actions buy time, retain the initiative, and preserve the balance of power in close operations. Figure 3-31 shows planning considerations for this mission.

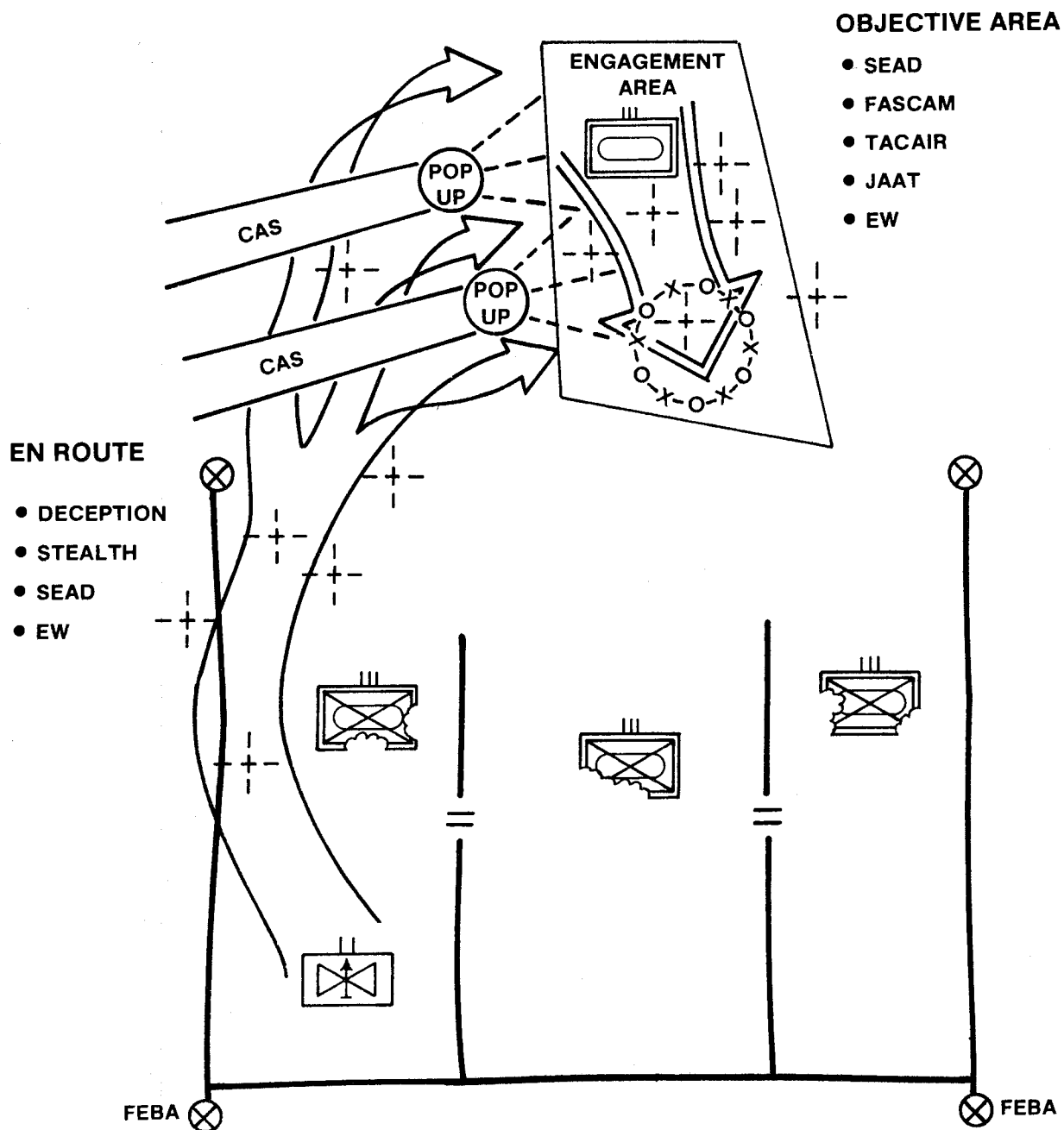


Figure 3-31. ATKHB attack on enemy second-echelon forces

(e) As an integral part of the covering force mission, ground maneuver units often conduct delay operations to slow the momentum of the attack. The covering force commander ensures that delaying units do not become so decisively engaged that they lose their freedom to maneuver. If they do, these units may be bypassed or encircled by the attacking force. To preclude these situations, the covering force commander interjects attack helicopter units into the battle at critical times. Their combat power distracts

and disrupts the attack while ground units disengage and displace. In this mission profile, timing is critical. Therefore, premission planning should include reconnaissance of battle positions. These positions should allow flanking engagements into the attack force. They should also provide clearly defined control measures; thus events can take place in the proper sequence. For instance, the ground unit commander notifies the ATKHBs when the enemy reaches a designated phase line. Then the battalion moves to a designated forward holding area. When the enemy reaches a second phase line, the ground commander issues the battalion a prearranged signal. The battalion then moves its attack companies into previously selected battle positions and provides maximum fires against the enemy's flanks. If attack helicopter fires overwhelm the enemy force, the ground commander can either displace or remain in position to continue the fight. The decision not to automatically displace is important. Once deployed into an assault formation, an enemy force is extremely vulnerable to attack from an unanticipated direction. Figure 3-32 depicts this sequence of events for integrated delay actions.

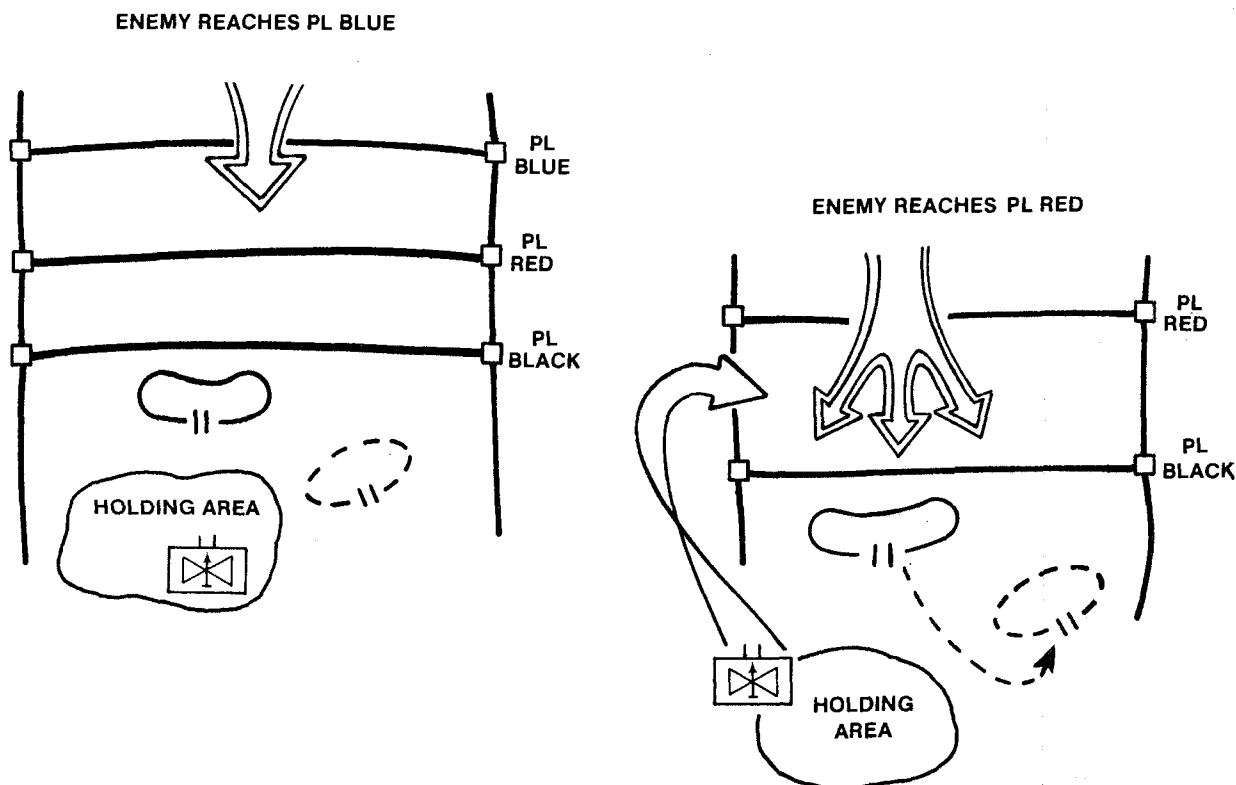


Figure 3-32. Integrated delay actions

(f) Individual ground maneuver units may defend as part of the covering force mission to deny the enemy access along a specific avenue of approach. They may also defend when the momentum of the attack fades and the enemy first echelon can be stopped. Defensive operations generally are static. Attack helicopter units require considerable maneuver space; therefore, they should never be confined to a static disposition within a defense plan. Instead, attack helicopters should capitalize on their unrestricted

maneuver advantage over enemy ground forces. They could be employed in continuous attacks throughout the depth of the battlefield against the enemy's flank or rear units. They could also conduct spoiling attacks against enemy formations that have halted or have been slowed. Because attack helicopter units often operate forward of friendly ground units, direct and indirect fires must be coordinated. All of the coordination requirements presented in Figure 3-30 should be addressed. Fire distribution guidelines, fire support priorities, and coordination for movement and fires across unit boundaries should be emphasized and coordinated. Figure 3-33 illustrates the concept for ATKHB employment during defensive operations.

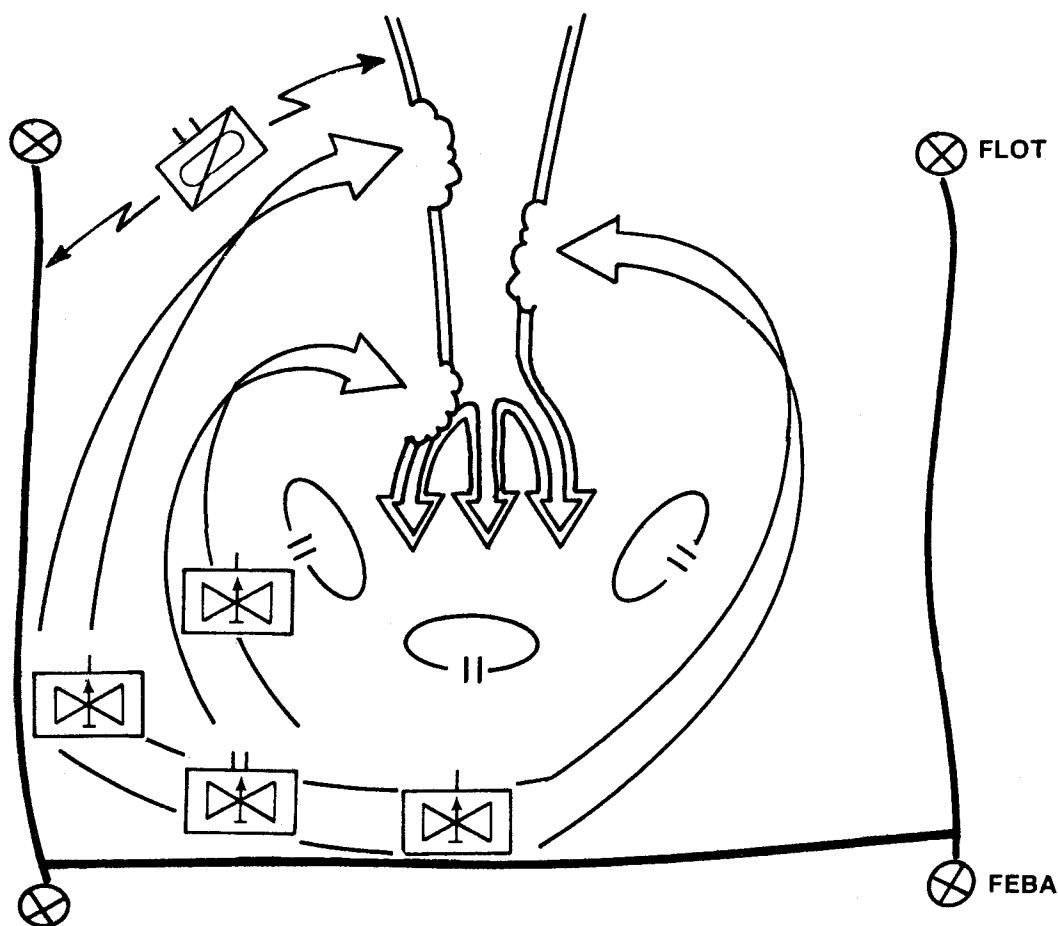


Figure 3-33. ATKHB employment during defensive operations

(g) The covering force should counterattack when the opportunity presents itself. Counterattacks in the security area should be short and violent. The objective is to destroy the enemy force before it can respond. In counterattack situations, attack helicopters are usually employed in large numbers to ensure fire superiority over the enemy at the

critical point in the battle. They normally maneuver along different attack routes and should attack from a different direction than ground forces. (Figure 3-28 illustrates counterattacks in the security area.)

(h) When planning CSS requirements, commanders must anticipate high consumption of Classes III and V to sustain ATKHBs. Ensuring that these items are sent forward to Class III supply points and ATPs close to the security area is critical. Also, the positioning of FARPs directly affects turn-around times and responsiveness to sustained operations. Another factor that may affect the employment of attack helicopters is imposed controlled supply rates. Control may be required because of limited supplies of rockets, anti-tank missiles, and other high-use munitions. Employment plans need to be flexible because this restraint may adversely alter the unit's capabilities.

(3) AHC roles. As part of the covering force mission, the AHC performs air assaults or emplaces ground forces into antiarmor ambush sites. It also anticipates extensive support missions to assist in battlefield preparation and force sustainment. The AHC transports barrier materials, supplies, and equipment to forward units and constantly repositions FARPs and resupplies them with Classes III and V. AHC assets may also evacuate wounded personnel and transport replacements forward if other divisional assets cannot meet battlefield requirements.

(4) CAC roles. The command aviation company provides C² aircraft and may augment force commanders with target acquisition aircraft. Other aviation brigade assets, such as the cavalry and air reconnaissance squadrons or ATKHBs, may also employ target acquisition assets. The CAC augments reconnaissance and attack forces and assists with rapid and accurate adjustment of fires and laser designation in the squadron's reconnaissance and screening missions or attack operations.

3-29. COVERING FORCE OPERATIONS DURING OFFENSIVE OPERATIONS

The aviation brigade may also conduct a covering force operation during an offensive operation such as a movement to contact. Movement to contact gains or reestablishes contact with the enemy. It develops the situation early and results in an advantage before the decisive engagement. This operation is characterized by decentralized control and rapid commitment of forces. It terminates when enemy resistance requires the deployment and coordinated effort of the division. During a movement to contact, the division normally is configured with a covering force, an advance guard, flank and rear guards, and the main body as depicted in Figure 3-34. Each of these elements performs a distinct mission to support the movement to contact.

a. Aviation Brigade Missions. During a movement to contact, this brigade can execute several missions at the same time to support division operations. Within light divisions, the brigade may normally be designated as the controlling headquarters for either the covering force or the advance guard.

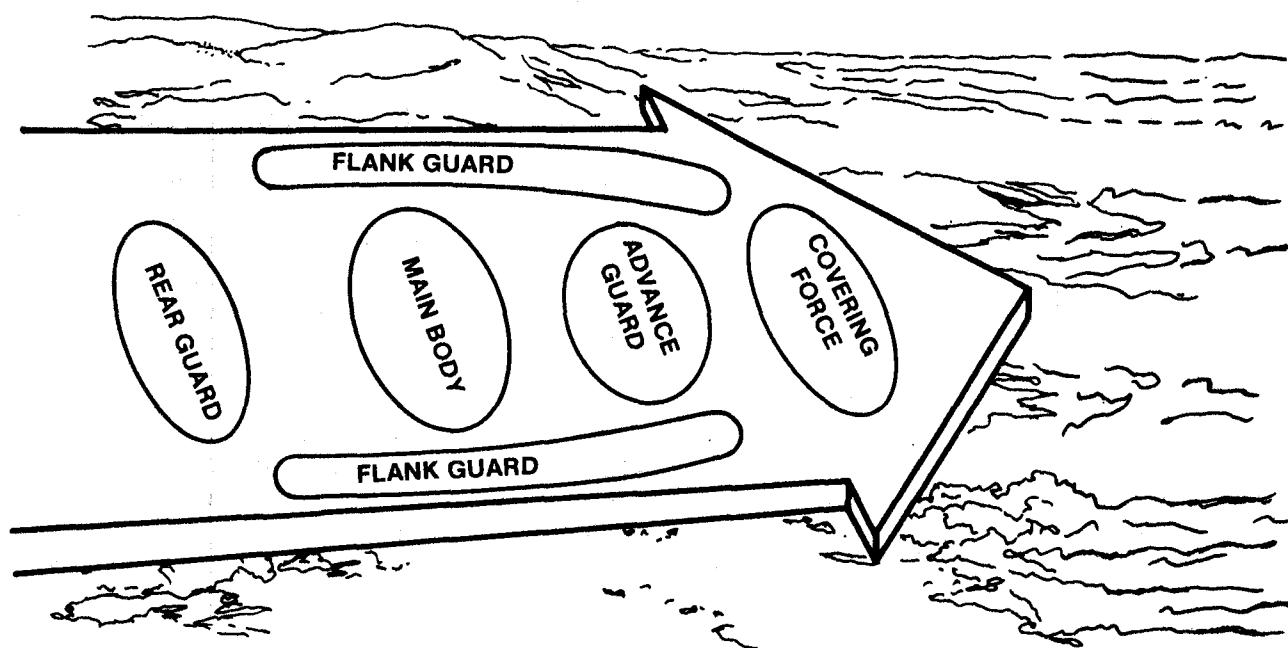


Figure 3-34. Organization for movement to contact

(1) When supporting the division, the brigade employs its subordinate assets to enhance and extend division capabilities. As depicted in Figure 3-35, the cavalry and air reconnaissance squadrons may participate in the covering force to conduct screening operations. At the same time, the ATKHBs positioned in forward AAs are ready to react to enemy contact initiated by the covering force or advance guard. Also, the AHC helps displace FARPs forward and is prepared to accept on-order missions to conduct air assault operations when task-organized. In this situation, the aviation brigade commander must control his assets closely to respond in a timely manner to contingencies that may develop.

(2) As the controlling headquarters for the covering force, the aviation brigade must be augmented with additional ground maneuver forces and receives CS assets in direct support. Figure 3-36 shows possible locations for maneuver elements under aviation brigade control. The cavalry squadron provides reconnaissance, initiates contact with the enemy, and develops the situation. As ground task forces maneuver to engage enemy forces, ATKHBs can respond by providing firepower to the ground brigade commander. The AHC performs missions to sustain the movement of the force.

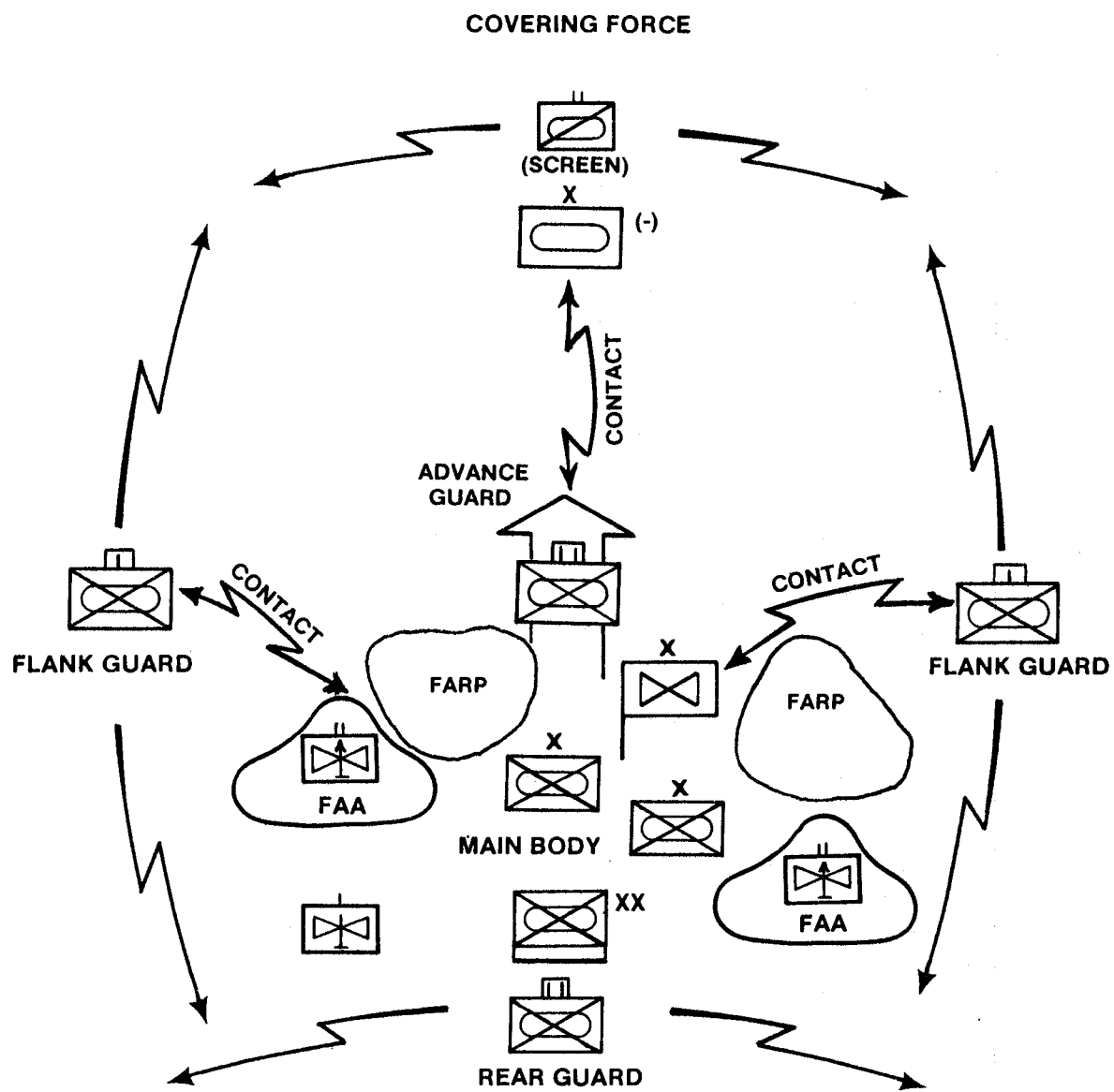
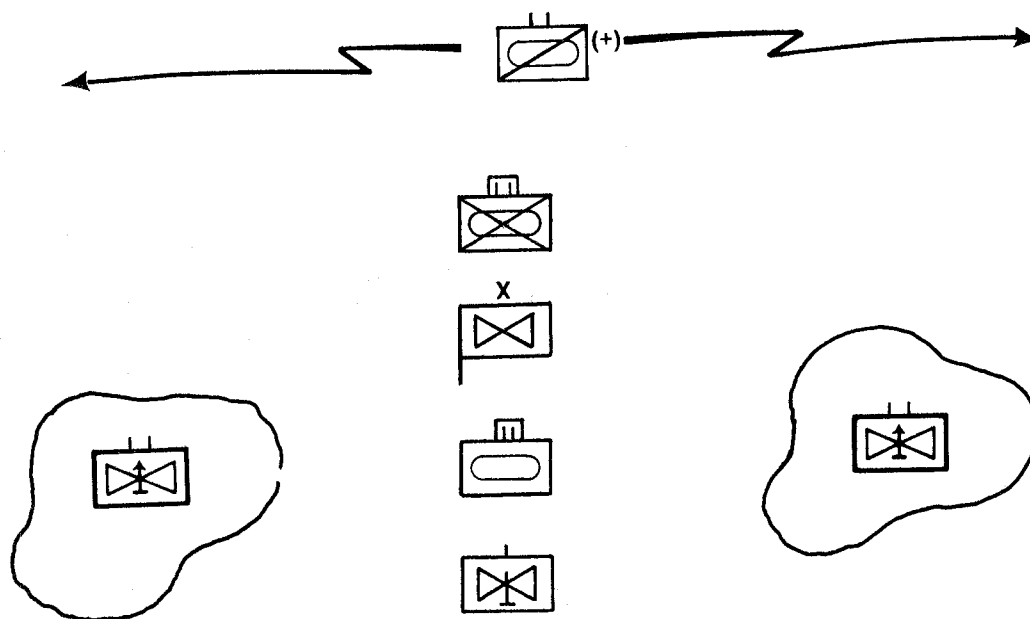


Figure 3-35. Aviation brigade in division movement to contact



NOTE: The AHC moves FARPs forward as movement to contact advances.

Figure 3-36. Aviation brigade task-organized with ground maneuver forces in a movement to contact

b. Cavalry and Air Reconnaissance Squadron Roles. The major role of the squadrons is reconnaissance and screening operations. FMs 1-117 and 17-95 describe the employment of the squadrons in more detail.

c. Ground Maneuver Battalion Roles. Ground maneuver battalions must augment the aviation brigade in covering force operations. Their additional maneuver capability maintains the momentum of the movement to contact. These battalions follow cavalry or air reconnaissance forces. Once the cavalry has established initial contact with the enemy, battalions attack to penetrate and destroy the enemy's forward defenses.

d. ATKHB Roles.

(1) The ATKHBs give the aviation brigade the necessary organic combat power to engage, fix, and destroy the enemy. Their ability to move rapidly and mass firepower at the decisive place and time gives the task force commander a formidable unit to seize, retain, and exploit the initiative.

(2) During a movement to contact, attack helicopters are critical to the success of advance forces and the main body. As the covering force encounters enemy formations, attack helicopters move forward to engage them. These helicopters can strike deep to attack enemy forces as they reposition in response to covering force actions. They can also assist ground forces in bypassing enemy positions. With the mobility and firepower of these

battalions, the task force commander can often overwhelm the enemy and seize the initiative without marshaling ground forces to attack. Also, attack helicopters may augment the reconnaissance and screening capability of the cavalry and air reconnaissance squadrons.

(3) The availability and responsiveness of ATKHBs are key factors in their employment. However, the battalions cannot be expected to maintain continuous overwatch while awaiting the employment of ground maneuver forces. They normally operate from successive FAAs. FM 1-112 gives specific information on the tactical employment of ATKHBs to support a ground maneuver unit.

e. AHC Roles. The AHC's roles in a movement to contact are critical to sustaining the entire operation. To avoid overcommitting the AHC, additional assets may be requested from the corps aviation brigade to augment the company's mission. The AHC moves personnel, supplies, and equipment rapidly throughout the battlefield to support the operation. Foremost is movement of fuel and ammunition so that the aviation brigade's air assets can continue to move. Also, the company conducts air assault operations to seize terrain that is critical to ground forces; or it can block the movement or withdrawal of the enemy.

f. CAC Roles. The roles of the CAC are essentially the same for all offensive operations. The CAC provides C² and AFSO aircraft and SEMA assets throughout the division area. The company conducts most missions under OPCON or in a DS role. The division commander determines the priority for committing company assets based on recommendations of the division aviation brigade commander. Taskings are coordinated between the division aviation LO and the G3 and then forwarded to the brigade S3.

3-30. MAIN BATTLE AREA OPERATIONS

Most likely, the decisive battle will be waged and the fate of the engagement determined within the main battle area. The enemy should be contained and defeated forward of or within the MBA.

a. Aviation Brigade Missions. As the division commander reviews options for the employment of the aviation brigade in the main battle, he should consider alternatives that capitalize on its flexibility and speed of maneuver. These options often include designating it as the division reserve or employing its assets throughout the MBA to support the division commander's concept of operation. The assignment of a specific sector to this brigade is another possibility. However, it will probably occur less often. In each of these roles, the aviation brigade can anticipate continuous employment of its subordinate assets during the main battle; the aviation brigade may be employed as a part of the division.

b. Cavalry and Air Reconnaissance Roles. The cavalry and air reconnaissance squadrons in the MBA provide reconnaissance and screening operations to the front, flanks, and rear of the division area. It also maintains lines of communication, provides traffic control, and enhances C³I once the battle is joined. During the MBA fight, the cavalry and air reconnaissance squadrons conduct continuous reconnaissance in support of

current operations and provide security as required. It may also conduct combat operations in rear areas. Although the cavalry and air reconnaissance squadrons are normally under division control, the aviation brigade headquarters monitors intelligence reports from the squadrons or the division intelligence net to stay informed on the current situation. FMs 1-117 and 17-95 contain further information on the employment of the squadrons.

c. Attack Helicopter Battalion Roles. Because of the many possible missions for the ATKHB, associated command relationships may change often and may become complex. Placing an ATKHB under OPCON of a forward brigade directly affects the availability of those assets for other division contingencies. One deciding factor is the certainty with which the division commander can identify the enemy's main effort. If the main attack is clearly defined, the division commander may place one ATKHB under the OPCON of a specific forward brigade; thus the ATKHB can concentrate its efforts in that sector. When the enemy effort is not as clearly defined, the division commander may retain both attack battalions under aviation brigade control and assign priorities for their employment. As the battle develops, he can then employ those assets in the best way as depicted in Figure 3-37.

d. AHC Roles. The roles of the AHC in the MBA are similar to its roles in covering force operations. Through the aviation brigade headquarters, the company receives division support missions to move personnel, equipment, and supplies for close operations.

e. CAC Roles. The CAC performs missions as previously discussed. Most likely, the company will employ assets throughout the MBA in support of other maneuver commanders; but it may also augment other aviation assets.

3-31. DIVISION RESERVE MISSION

The aviation brigade provides the division commander with another headquarters in which he may build a reserve. Therefore, he may sometimes elect to fight with three brigades forward and configure the reserve around the aviation brigade. The aviation brigade executes the division reserve mission in addition to other mission requirements during close operations. A reserve is a portion of a force that is withheld from action at the beginning of an engagement. Thus it is available for commitment later at a decisive point and time. When a commander sets a portion of his forces aside as a reserve, he has formulated a plan for these forces. Reserves are not used to redeem failures; reserves are designated by the commander to be committed at a decisive point and time to exploit success or to ensure mission accomplishment. Reserves are employed during offensive and defensive operations. In the offense, reserves exploit success by attacking enemy forces where they are weakest. Reserves reinforce or maintain momentum by passing through or around friendly units held up by enemy forces. Also, reserves can defeat enemy counterattacks. In the defense, reserves reinforce the defense of committed forces. They contain enemy forces that have penetrated friendly defenses. In addition, they counter rear area threats and relieve depleted units. During defensive operations, a reserve force is mainly to regain the initiative through offensive action.

a. Nature of Reserve Forces. Reserves must be able to move rapidly to seize opportunities on the battlefield. The size of the reserve force depends on METT-T. The size may be at least one-third of the entire force. At the division, the reserve may be composed of a maneuver brigade and the division's aviation assets. At the brigade, the reserve may be made up of a battalion task force with aviation assets placed under OPCON of the brigade. A battalion task force normally has a company team for a reserve. Aviation assets under OPCON of the brigade may be tasked to augment or support a battalion's task force; however, these assets will remain under OPCON of the brigade headquarters.

b. Aviation as a Reserve. Aviation forces are ideal for the division reserve mission. As the headquarters for a reserve, the aviation brigade plans missions to contain penetrations during close operations and to destroy enemy forces with counterattacks. When established as the reserve, the brigade is normally augmented with ground maneuver forces to enhance its capabilities for blocking actions and retaining critical terrain. In his planning, the brigade commander organizes combined arms task forces based on the commander's intent and METT-T. He issues "on-order" missions to organic units and units under OPCON that participate in reserve missions. He also plans CS and CSS requirements. As the reserve, the brigade also provides the division commander with a responsive force for conducting deep and rear operations contingencies. The brigade is employed as a reserve in the rear to counter Threat incursions. Although the brigade headquarters is in a reserve posture, its subordinate units may remain actively engaged in maneuver, CS, and CSS operations throughout the division sector.

c. Attack Helicopter Battalions. ATKHBs normally are a reserve for the division or a ground brigade. Attack forces may be held in depth initially and respond promptly when needed. They are often the most effective means of reinforcing defenses against armored attacks that have broken through. Because of weather (visibility) limitations and a potentially high AD threat, they are never the only forces held in reserve. During offensive operations, attack helicopter forces are most often employed as a reserve during exploitation and pursuit.

(1) In an exploitation, the ATKHB is employed as part of a larger force. As ground forces succeed offensively, the ATKHB disrupts and destroys enemy armor, artillery, C² assets, and CSS and other enemy forces attempting to reorganize.

(2) In a pursuit, the ATKHB again forms part of a larger force. Ground forces continuously pressure the rear area of the withdrawing enemy. At the same time, attack helicopter forces attack along the flanks or move into blocking positions with AATFs blocking the enemy's line of retreat.

(3) In the defense, attack helicopter forces mass to destroy enemy penetrations of friendly defenses. While ground forces engage the enemy from defensive positions, attack helicopter units maneuver to the flank and rear units of the enemy to attack in depth.

d. Assault Helicopter Units. With ground forces, assault helicopter units seize key terrain along an axis of advance for a friendly attack during offensive operations. They may seize and secure bridges, tunnels, and choke points that, if held by the enemy, could slow the attack. During the offense, assault helicopter forces may move friendly ground forces to the flanks of enemy forces as they withdraw and friendly forces continue their destruction during an exploitation. In a pursuit, AATFs seize a blocking position to close the enemy's lines of communication and to prevent enemy counterattacking units from entering the engagement. During the defense, assault helicopter forces seize key terrain and occupy blocking positions along the areas of enemy penetrations. In occupying a blocking position, the AATF gives the commander time and space so that he can reposition his resources to destroy the penetration. The task force also allows the commander to retain the bulk of his reserves for a counterattack elsewhere so that he can regain the initiative. Assault helicopter forces move ground forces to the enemy's point of attack or maneuver quickly to the flanks of the enemy and counterattack.

3-32. OFFENSIVE OPERATIONS

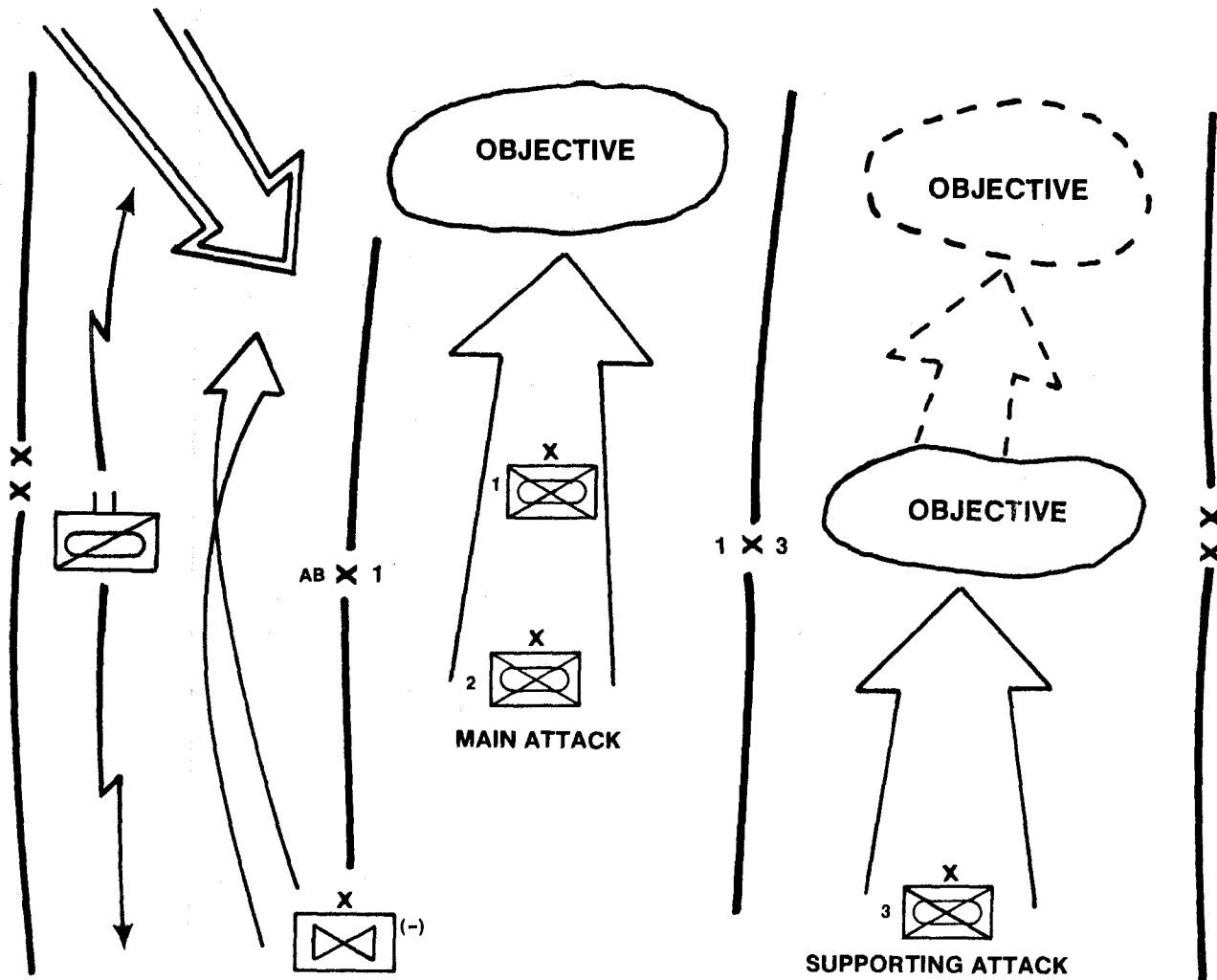
The aviation brigade is employed offensively during the force commander's offensive or defensive scheme of maneuver. The aviation brigade or subordinate elements may participate in all or a portion of offensive operations--movement to contact, hasty and deliberate attacks, exploitation, and pursuit.

a. Movement to Contact. During a movement to contact, the brigade or subordinate elements normally perform covering force operations. These are discussed in paragraphs 3-28 and 3-29.

b. Hasty Attack. The hasty attack is an offensive operation. It usually evolves from a movement to contact or proceeds from successful defensive operations. It may also develop from modifying a preplanned counter-attack operation or from continuing beyond the objective of a deliberate attack. Seizing and retaining the initiative over the enemy is the purpose of a hasty attack, regardless of its origin. Violent, aggressive action characterizes a hasty attack, which must be executed in minimal time. The principles of attack--concentration, surprise, speed, flexibility, and audacity--apply in a hasty attack as in other offensive operations. Throughout all operations, commanders must constantly seek opportunities to attack. They must determine quickly if the enemy can be defeated by hasty attack and, if so, execute the operation rapidly. Hesitation on the part of the commander may cause his forces to lose momentum; the enemy could then regroup and regain the initiative.

(1) Aviation brigade missions. Aviation brigade elements will often participate in the hasty attack to support division operations.

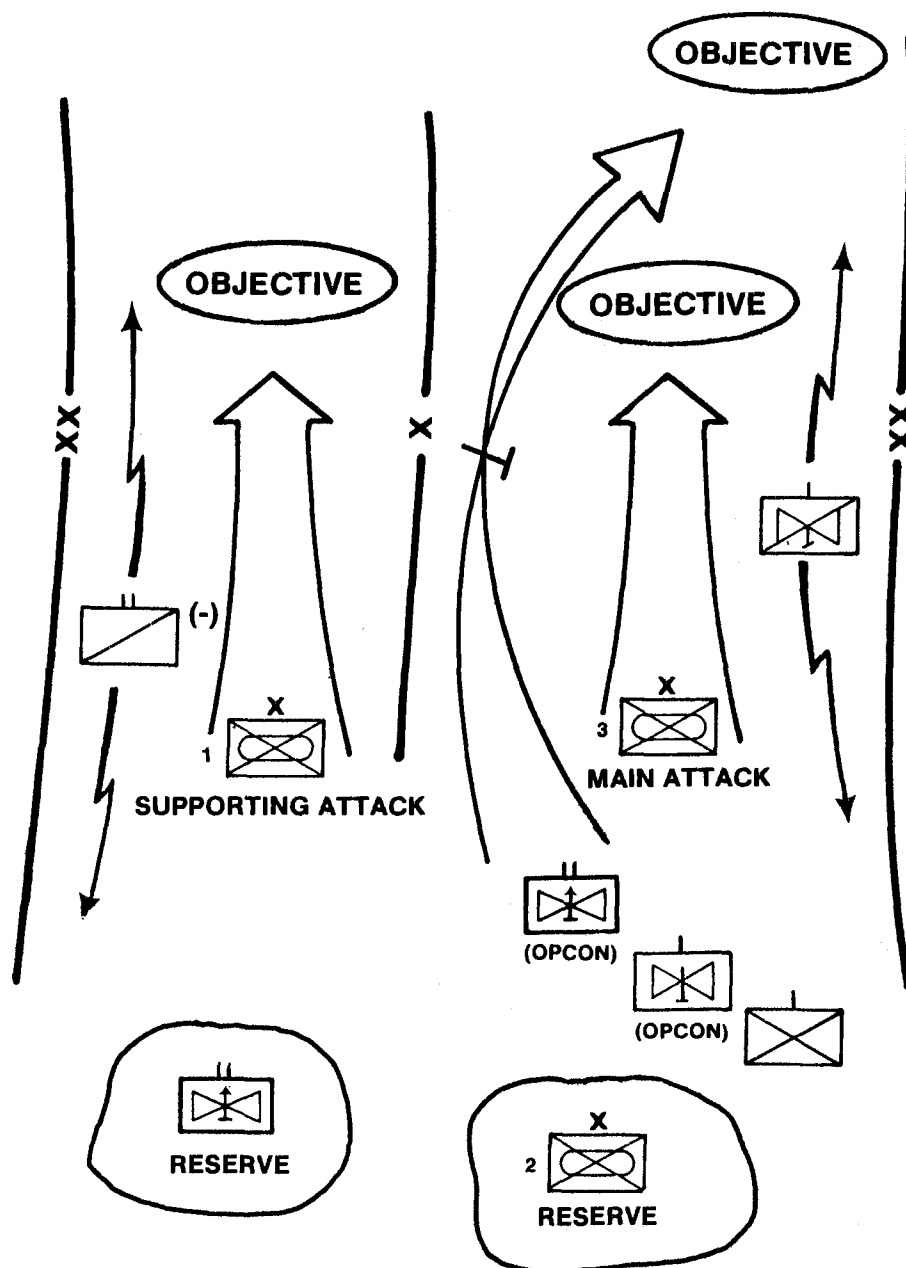
(a) The brigade may conduct hasty attacks as a maneuver force headquarters, either designated as an aviation brigade or task-organized with additional ground maneuver forces. Figures 3-38 through 3-40 show examples of these employment situations.



NOTES:

1. Division main attack penetrates enemy defenses.
2. Aviation brigade is employed as a maneuver force to blunt enemy counterattack.
3. Cavalry squadron is employed to screen the division flank and provide security as the enemy formation is attacked by both ATKHBs.
4. AHC repositions FARPs to support the attack.

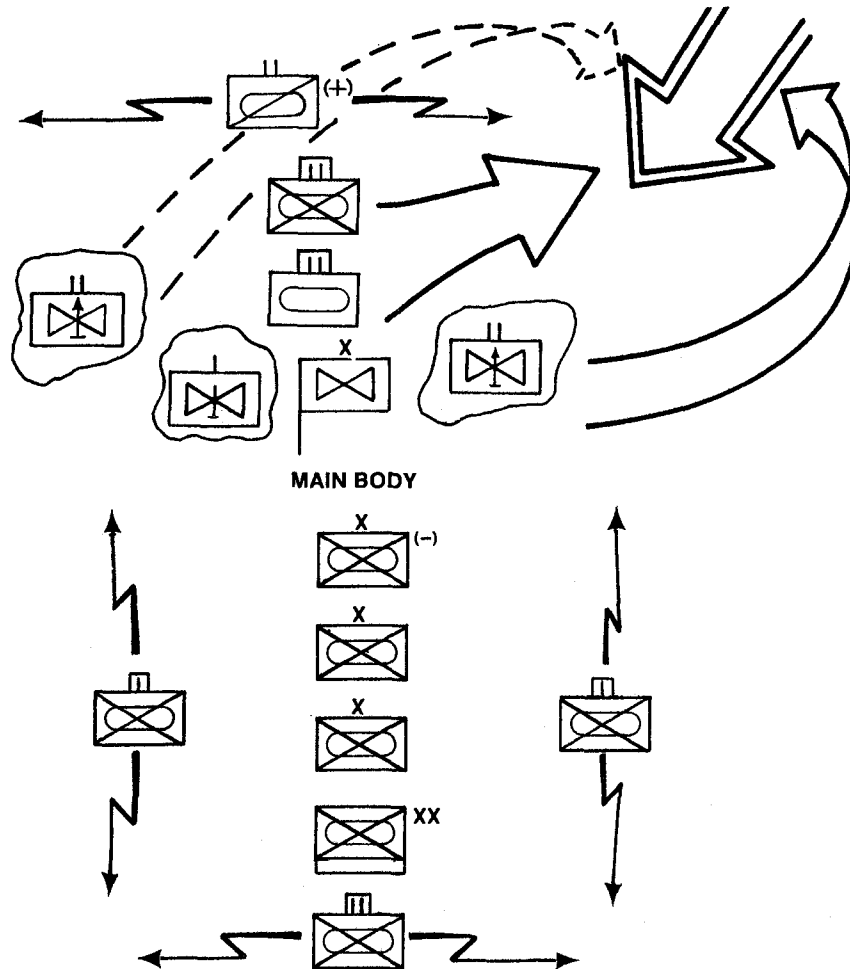
Figure 3-38. Aviation brigade assets participating in a division hasty attack



NOTES:

1. Cavalry squadron screens flanks.
2. ATKHB and AHC conduct air assault under OPCON of ground brigade.
3. ATKHB is reserve.

Figure 3-39. Aviation brigade in a hasty attack as a maneuver force



NOTES:

1. Division conducts a movement to contact with the aviation brigade controlling forward elements.
2. Covering force makes contact with moving enemy force.
3. Aviation brigade attacks enemy formation with an ATKHB as ground task forces deploy to develop the situations.
4. Second ATKHB is prepared to reforce the attack on order.

Figure 3-40. Aviation brigade in a hasty attack as a maneuver force augmented with additional ground maneuver forces

(b) To execute a hasty attack rapidly and decisively, leaders need a simple scheme of maneuver and effective SOPs and battle drills. They must react quickly so that the initiative and opportunity are not lost.

(2) Cavalry and air reconnaissance squadron roles. Primarily because of their reconnaissance mission, the squadrons will normally be the first forces of the division to locate and establish contact with the enemy as described in FMs 1-117 and 17-95.

(3) ATKHB roles. In the hasty attack, attack helicopters can shock and overwhelm enemy forces with their speed and firepower; then they can seize the initiative. They are best employed against moving, massed enemy

forces. Figure 3-41 depicts an ATKHB attacking enemy forces moving to reinforce a position under attack. In other missions, the ATKHB--

- Attacks enemy counterattacking forces.
- Provides immediate antiarmor firepower.
- Attacks withdrawing or moving enemy forces.
- Attacks bypassed units or pockets of resistance.
- Attacks enemy uncommitted reserves, C² nodes, and support facilities.
- Screens forward or to the flanks of an attacking force.
- Conducts air combat.

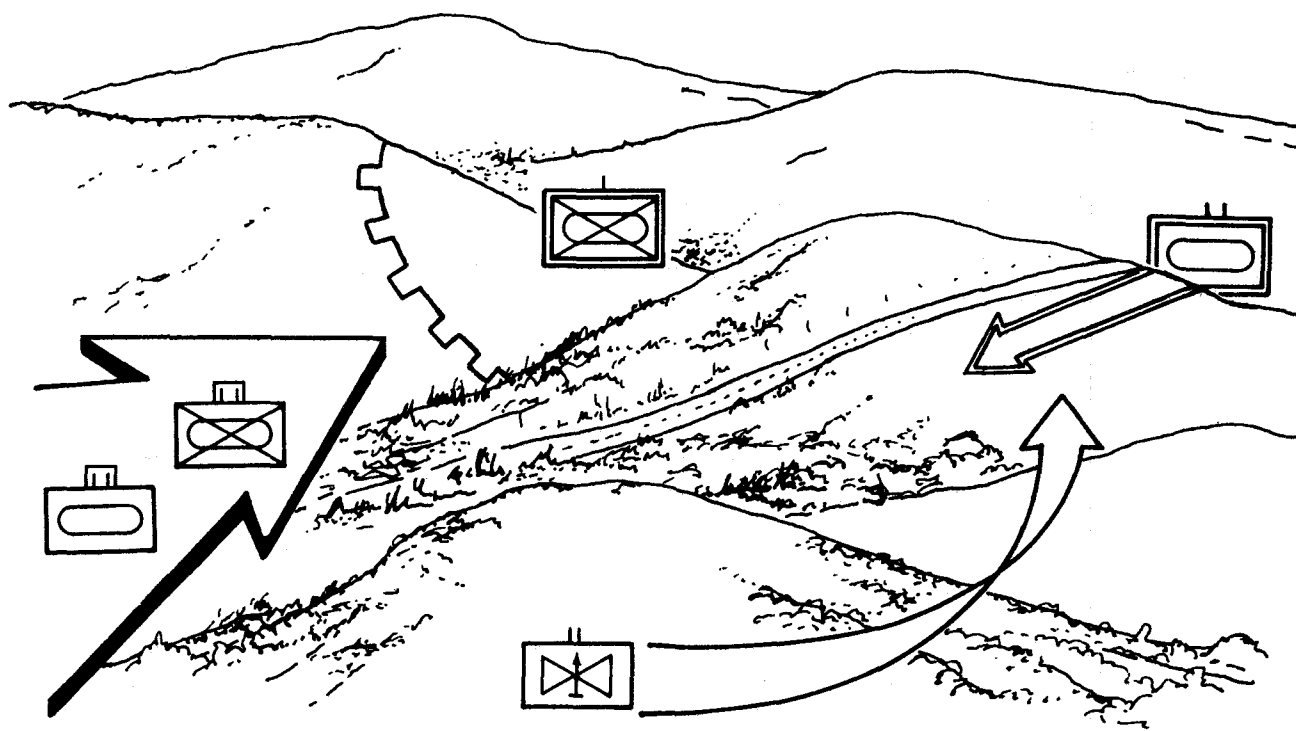


Figure 3-41. Attack helicopter battalion in a hasty attack

(4) AHC roles. Helicopters carrying air assault forces form a combat maneuver force that can conduct a hasty attack. This force can seize key terrain to block enemy movement, reinforce a weakened sector, or exploit a tactical advantage gained by attacking forces. Assault helicopters can also place forces in the enemy's rear area to disrupt its maneuver potential and make it fight in two directions at once.

c. Deliberate Attack.

(1) Purpose. A deliberate attack becomes necessary when enemy forces cannot be defeated by a hasty attack or cannot be turned or bypassed. It is also necessary to secure key terrain or destroy substantial enemy forces.

(a) Commanders and staffs must plan and coordinate every phase of a deliberate attack. They gather detailed intelligence from all available sources to determine the actual disposition and capabilities of the enemy. Before attacking, leaders ensure that thorough reconnaissance, target acquisition and development, and a detailed analysis of all related factors have been completed. The success of a deliberate attack requires positive, aggressive leadership at all levels of command. Combat power must be rapidly concentrated to exploit the enemy's weaknesses; the attack must be violently executed.

(b) A deliberate attack is expensive in terms of manpower, equipment, supplies, and time. Such an attack requires detailed planning and the assets to execute the operation. When friendly forces are on the move, a deliberate attack is the least desirable method of attack. It may often lead to loss of momentum; thus the enemy may be able to react, regroup, and reinforce its positions. Therefore, the movement to contact and the hasty attack are preferred over the deliberate attack.

(2) Aviation brigade missions. The aviation brigade conducts deliberate attack missions in deep, close, or rear operations areas. If attacking heavily fortified positions, it must be augmented with additional ground maneuver forces.

(a) The roles of the aviation brigade units during a deliberate attack differ little from those during a hasty attack. The main difference is the amount of planning, coordination, and preparation that takes place before the attack.

(b) During deliberate attack operations, the cavalry and air reconnaissance squadrons perform reconnaissance and screening for the attacking force. The ATKHBs then envelop enemy positions and strike moving enemy reserve formations; at the same time, ground maneuver forces assault and break through the more heavily fortified positions. The AHC may be task-organized with infantry to conduct air assaults for blocking enemy withdrawal routes or securing objectives.

(3) Cavalry and air reconnaissance squadron roles. The squadron conducts continuous reconnaissance operations before and during the deliberate attack. These operations provide real-time intelligence for planners and attackers. During the attack, the squadron may screen the maneuvering

force from surprise as it moves to the objective as shown in Figure 3-42. In the deliberate attack, the cavalry and air reconnaissance squadron--

- Provides limited security for maneuvering forces.
- Conducts feints and demonstrations to deceive the enemy.
- Locates enemy egress routes and disrupts withdrawal of enemy forces.
- Reconnoiters for vulnerabilities in the enemy defense.
- Locates enemy command and control elements, logistics facilities, and reserve forces.
- Conducts delay operations, with augmentation, to allow massing of forces for the attack.
- Provides rear area security.
- Secures lines of communication.

(4) ATKHB roles. Attack helicopter battalions are part of the scheme of maneuver in the deliberate attack. These battalions provide mobile and flexible combat capability. They are least effective against heavily fortified positions; they cannot seize and hold terrain. They are best suited for attacking massed, moving enemy armored formations. In the deliberate attack, ATKHBs can--

- Conduct air combat.
- Attack to exploit initial successes.
- Attack withdrawing enemy forces or moving enemy reserves.
- Conduct independent deep attacks to destroy enemy C² elements, logistics facilities, and maneuver forces or to participate in a scheme of maneuver in close or deep operations.

(5) AHC roles. Assets move combat troops and equipment into the fight; or they move equipment and supplies to sustain the fight. With these assets, an AATF may actively participate in the attack. The AHC is ideal for increasing the mobility of the attacking forces and for accelerating combat as the fight moves to the exploitation phase.

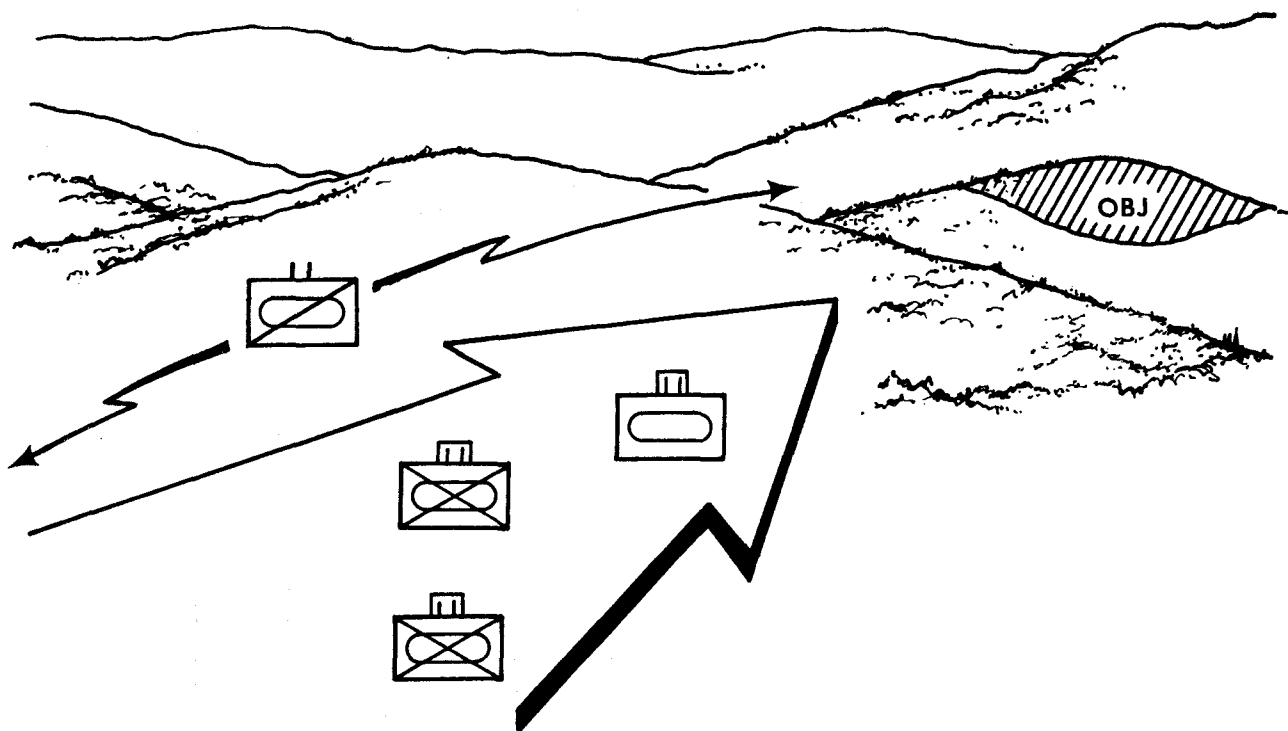


Figure 3-42. Cavalry or air reconnaissance squadron screening during deliberate attack

d. Exploitation.

(1) Purpose. Exploitation takes immediate advantage of a newly created or discovered enemy weakness. The objective is to strike swiftly and deeply into the enemy's defense and destroy its ability to conduct an orderly withdrawal. The exploitation is initiated when the enemy cannot maintain its defenses. The enemy's vulnerability to exploitation is indicated by the--

- Increase in abandoned materiel.
- General decrease in enemy resistance.
- Increase in the number of prisoners being captured.
- Overruns of the enemy's artillery positions, CPs, signal installations, supply dumps, and supporting units.

(a) The exploitation is an opportunity to make gains well beyond those dictated by normal force ratios. In just a few days, more gains can be made than in months of other operations. Exploitation forces should be large and reasonably self-sufficient. They should be well supported and have the mobility to change direction on short notice.

(b) The exploitation begins with forces maneuvering deep to continue the momentum of the attack. As the battle progresses, commanders normally will designate exploiting forces by issuing FRAGOs during the attack. An objective is assigned to the exploiting force. The objective will be one that, if captured or destroyed, will contribute significantly to destroying organized enemy resistance.

(2) Aviation brigade missions. The aviation brigade is an ideal exploitation force; it is well suited to the fast tempo of this operation. The brigade can easily maneuver to outflank or cut off enemy forces, fixing them so that they can be destroyed. During an exploitation, the brigade will capitalize on early success, maintain the momentum of the operation, and keep the enemy off balance. It must maintain continuous pressure against enemy forces to prevent them from reorganizing their forces and especially from reinforcing their defenses. Destroying C² facilities, cutting lines of communication, and destroying the logistic capability will be primary missions. Figure 3-43 shows the aviation brigade in exploitation.

(3) Cavalry and air reconnaissance squadron roles. The squadron provides reconnaissance and screens for the exploiting force. It conducts reconnaissance to assist the force in maintaining rapid and continuous momentum. As contact continues with the enemy, the squadron reconnoiters the rear area to locate enemy forces and targets. FMs 1-117 and 17-95 further explain squadron roles.

(4) ATKHB roles. ATKHBs strike the enemy in rear areas and flanks to disrupt its withdrawal or reorganization as exploiting ground maneuver forces continue to attack. As they maneuver against the enemy, the ATKHBs can destroy maneuver and fire support forces, C² facilities, and logistics installations and can counter Threat helicopters.

(5) AHC roles. The AHC rapidly moves troops, equipment, and supplies forward to maintain the momentum. When combined with infantry as an AATF, the AHC seizes key terrain, crosses obstacles, and otherwise uses its mobility to block and cut off disorganized enemy elements.

e. Pursuit.

(1) Purpose. As the enemy begins to lose its ability to defend or delay and attempts to disengage and withdraw, exploitation may develop into pursuit. The main purpose of pursuit is to destroy the enemy force completely. Success during pursuit requires unrelenting pressure against the enemy to prevent it from reorganizing and preparing defenses. Despite the lack of time for planning and coordination, the transition to the pursuit must be rapid. Commanders of all units in exploitation must anticipate the transition to pursuit and continually consider new courses of action. Two separate forces are designated for a pursuit.

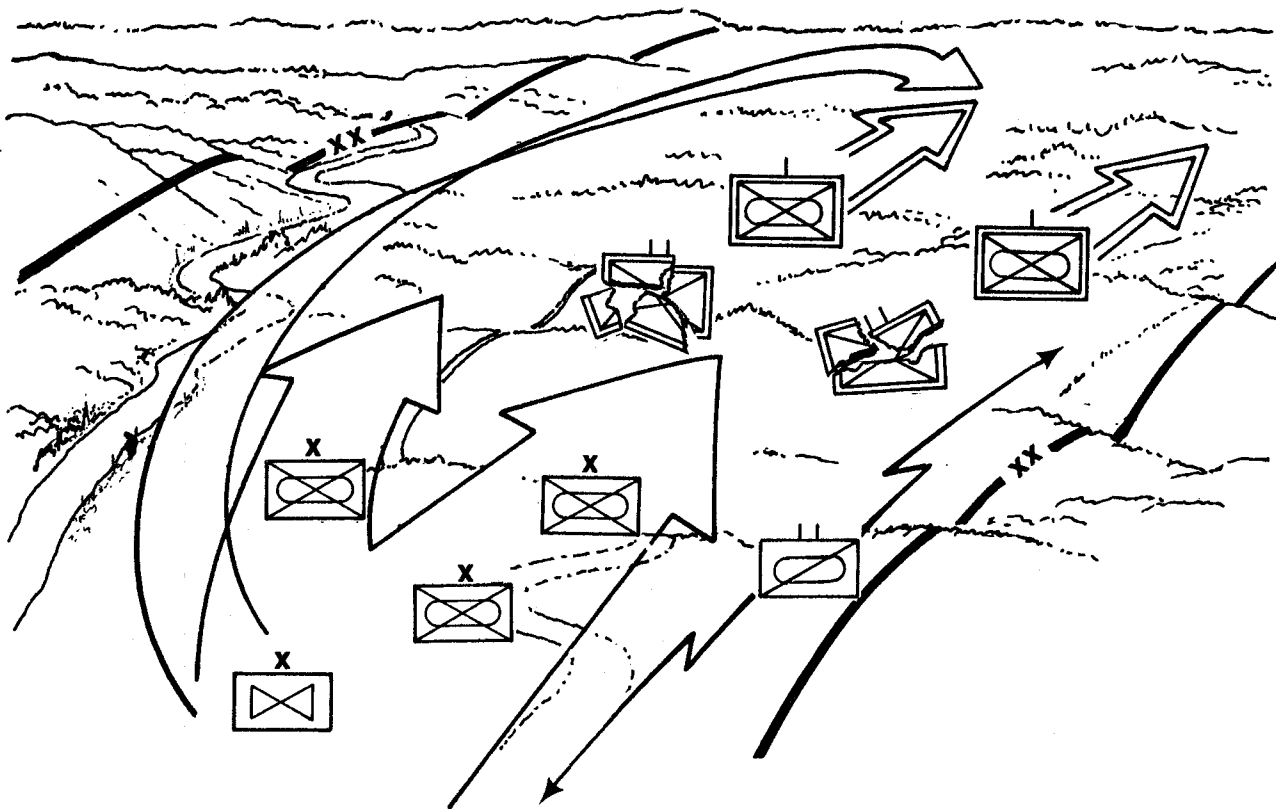


Figure 3-43. Aviation brigade in exploitation

(a) Direct pressure force. The first force is a direct pressure force. It conducts a series of hasty attacks to maintain forward momentum and to cause maximum casualties. Preferably, armor-heavy forces would continue day and night with unrelenting violence.

(b) Encircling force. The second force is an encircling force that moves swiftly to cut off the retreating enemy. The encircling force must be at least as mobile as the enemy. The force advances along routes parallel to the enemy's line of retreat to reach key road intersections, bridges, and mountain passes ahead of the enemy. The force then establishes strong blocking positions to cut off the enemy's escape routes. The ATKHBs are ideal flanking or encircling forces.

(2) Aviation brigade missions. The aviation brigade plays a major role in the pursuit. As part of the direct pressure force, it provides security, locates enemy forces, and attacks to destroy the enemy. As the encircling force, the brigade can outflank the retreating enemy, bottle up and block its forces, and complete the final destruction. Figure 3-44 depicts the aviation brigade in pursuit.

(3) Cavalry and air reconnaissance squadron roles. The squadron also screens for the direct pressure and encircling forces as they advance in the pursuit. Air assets are best employed to operate on the deep axis of advance in reconnoitering the withdrawing enemy to determine its retreat routes, egress routes, and location. Ground cavalry may operate more efficiently with the slower-moving, direct pressure force by conducting screen operations to warn of enemy reinforcements or flanking actions. The squadron is not normally fragmented; however, this particular role is one technique for its employment.

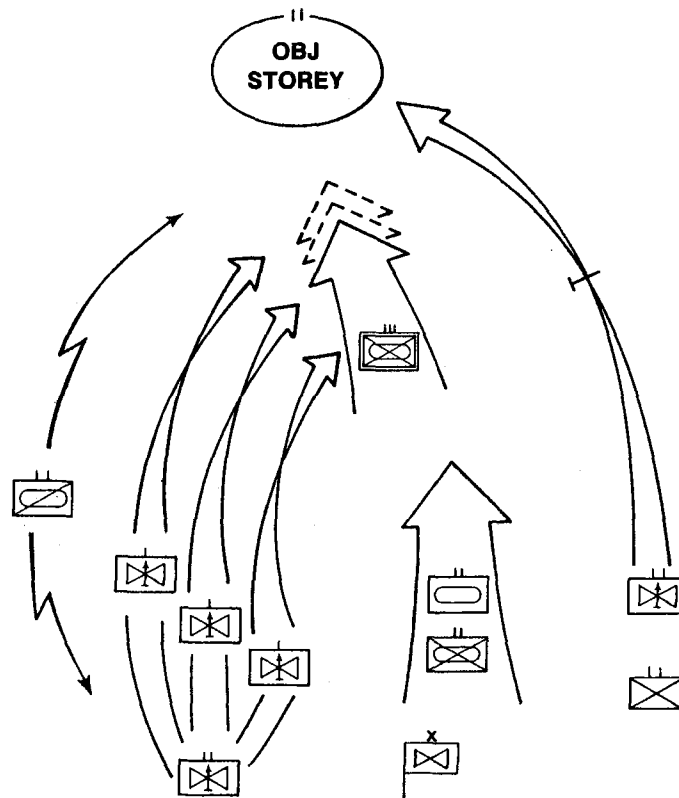


Figure 3-44. Aviation brigade in pursuit

(4) ATKHB roles. The ATKHB maneuvers deep to outflank and contain retreating enemy forces. Repeated attacks by the ATKHB will speed the disintegration of the enemy's ability to delay. As the encirclement proceeds, attack helicopters take the lead in blocking and defeating any breakout attack by the enemy.

(5) AHC roles. The AHC provides assets to sustain the pursuit. It also provides maneuver capability to promote the destruction of the enemy. Its assets can be used primarily in two ways. First, AHC assets rapidly move equipment and supplies forward to replenish critical shortages. This mission may become essential to sustain momentum. Second, AHC assets maneuver air assault forces to fight the battle and outdistance the enemy to block its withdrawal. Air assault forces quickly seize key terrain features, such as bridges, so that pursuit forces can advance rapidly.

3-33. DEEP OPERATIONS

During deep operations, the division aviation brigade is a critical asset. It is employed using several options.

a. Purpose. Deep operations deny the attacker the initiative by disrupting C², weakening critical assets, and delaying uncommitted forces. The desired effect is to ensure the success of close operations by foiling the attacker's plan and forcing the attacker to react to the unexpected. Deep operations may cause the enemy to fight in two directions and disrupt the time sequencing of the attack. Thus deep operations create opportunities for offensive action. With its maneuver speed, the aviation brigade is ideal for deep operations. The division aviation brigade may focus mainly on division close and rear operations; at the same time, corps aviation assets concentrate on deep operations. However, division aviation brigades will perform deep operations, possibly often, depending on METT-T and the commander's intent.

b. Capabilities. The division aviation brigade's capabilities include spoiling attacks, raids, deception operations (feints, demonstrations), air assault operations, and JAAT operations. The brigade may perform security tasks for the division similar to the corps aviation brigade. In its reconnaissance and C³I enhancement role, the division aviation brigade often functions as the most expeditious intelligence-gathering asset for the division commander. During deep operations, air cavalry or air reconnaissance troops may operate independently from the squadron to participate in aviation-pure maneuvers. Attack assets maneuver to isolate enemy follow-on forces and reserves, not allowing them to affect friendly maneuver operations. Attack helicopter forces conduct preemptive strikes or attacks against first-echelon enemy counterattack forces and conduct cross-FLOT air combat. Assault helicopter assets also participate in preemptive strikes against first-echelon enemy counterattack forces. CAC elements provide C³I enhancement, fire support functions, and air movement operations.

c. Employment. Employment of the division aviation brigade is similar to that of the corps aviation brigade. It is employed in operations of limited duration, operations to secure deep objectives, or operations to continue the attack.

(1) Operations of limited duration. This operation most closely resembles a raid. It involves a penetration into hostile territory to secure information and to deceive, delay, disrupt, or defeat the enemy with or without ground maneuver forces. The mission ends with a planned withdrawal.

(a) A limited-duration operation may be undertaken while the division conducts offensive or defensive operations. If the aviation brigade conducts a limited-duration operation alone, it is likely to be in response to timely intelligence indicating that an enemy maneuver force, a CS unit, or a valuable CSS asset is vulnerable to attack. This operation normally requires less planning time than other deep operations; but enough time must be allowed for preparation. When the aviation brigade conducts combined arms limited-duration operations, it often operates as part of or as the

controlling headquarters of an AATF. Speed, shock action, and timely intelligence are essential for any such operation to succeed.

(b) Synchronizing the battle is the most difficult challenge; yet it is essential. Figure 3-45 shows an operation of limited duration. Here, the brigade's mission is to destroy an independent tank battalion of the first echelon. Air cavalry and air reconnaissance elements are to expedite passage of lines, provide exact locations of enemy elements, and secure battle positions for attack aircraft. FA units provide SEAD for friendly forces while they move to and from the objective area. Attack aircraft move across the FLOT and conduct a deliberate attack.

(2) Operations to secure deep objectives. This option is a deliberate attack or operation with the goal of occupying an objective in hostile territory. The force stays behind enemy lines for a specific time to disrupt enemy CSS operations. Thus the enemy must divert combat forces from close operations to commit follow-on combat forces. This diversion may be required to counter the friendly incursion and hold a position for future offensive operations. This option is of a larger scale and longer duration than operations of limited duration. This option normally is selected when the division has decided to initiate offensive operations.

(a) This operation is most often a combined arms operation in which the aviation brigade operates as the maneuver headquarters or as part of a larger force. The cavalry and air reconnaissance squadrons perform reconnaissance and screening operations while the attack battalions maneuver. The brigade commander may command and control part or all of the operation. Assault helicopter assets function as part of an AATF and/or provide CS for the operation.

(b) Figure 3-46 shows an example of an operation to secure a deep objective. It depicts an aviation brigade supporting divisional operations in sector. Enemy offensive operations have been hampered by extremely rugged terrain in sector. Timely intelligence has identified an uncommitted enemy motorized rifle battalion(-) near Objective 1. The division commander wants to seize the initiative. He orders the brigade to conduct a deliberate attack and seize Objective 1 on AA Blue. On AA Green, the remainder of the brigade blocks the enemy's withdrawal by coordinated attacks into the enemy's right flank. The deliberate attack is successful, and the MR battalion(-) withdraws. Pockets of resistance remain across the sector. The division commander directs TF 2-71 to occupy Objective 1 and, with the assistance of the brigade, to continue to attack enemy forces in sector. The brigade establishes FARPs on Objective 1 to expedite operations from assembly areas in the third brigade sector.

(c) Several factors are essential to the success of operations to secure deep objectives. These are timely intelligence, speed, shock action, well-planned and supportable CS and CSS plans, effective SEAD, and combined arms operations. Linkup operations must be planned to ensure the survivability of the deep attack force.

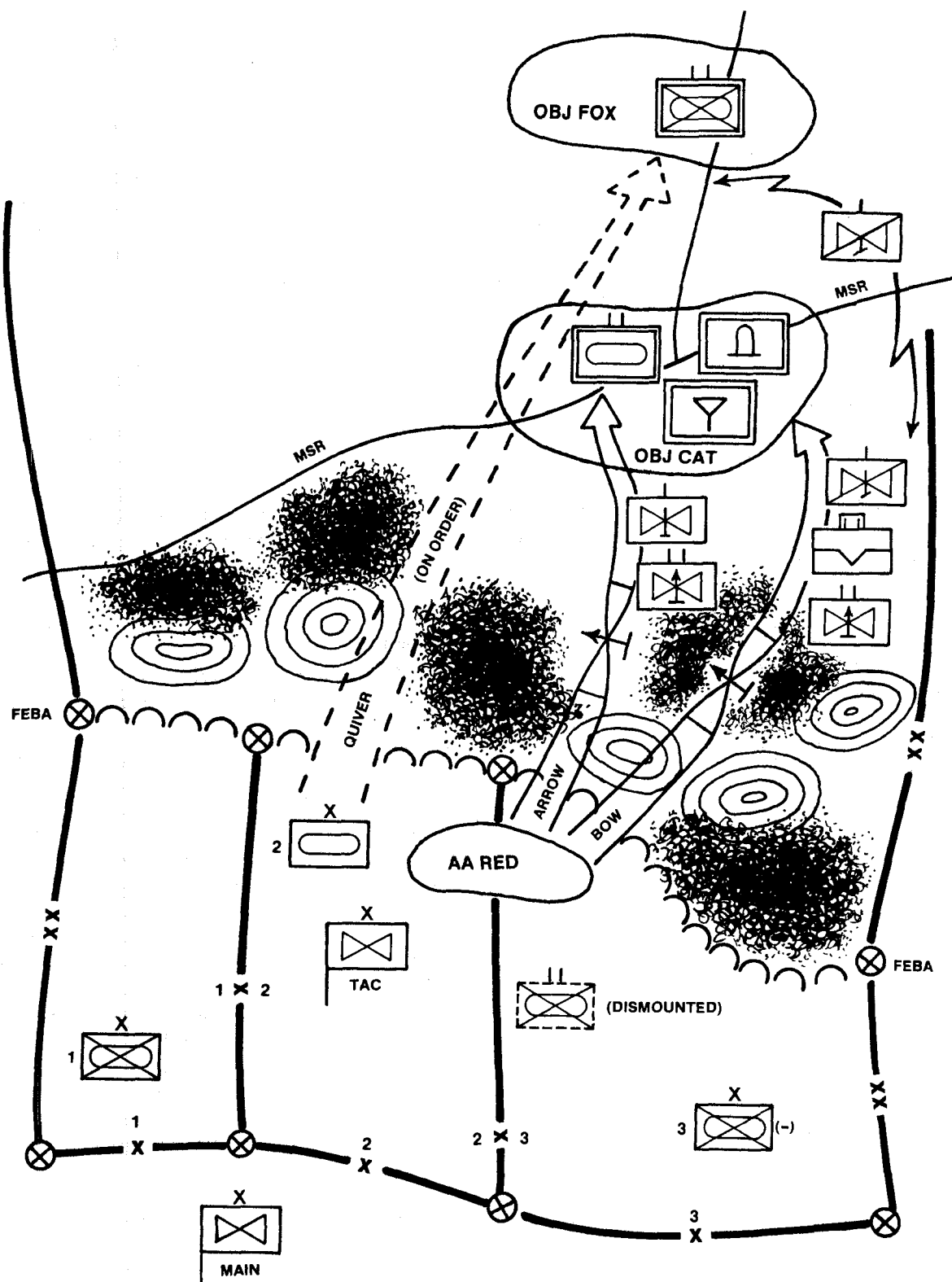


Figure 3-45. Aviation brigade assets conducting a deep attack to destroy an independent tank battalion

(3) Operations to continue the attack. This option is best described as an exploitation in response to successful division offensive campaigns or battles. This action prevents the enemy force from reconstituting its defenses and withdrawing its forces.

(a) This option is normally an aviation brigade operation during which the brigade is part of a larger force. The force operates for extended periods in the rear operations area of the enemy. The brigade's AHC moves essential CS and CSS, the cavalry and air reconnaissance squadrons conduct reconnaissance and screening operations, and the attack battalions perform maneuver operations. The brigade often assists a larger task force with C³I. Figure 3-47 shows an example of an exploitation using the aviation brigade. It depicts the aviation brigade continuing offensive operations from Objective 1 after the successful deliberate attack described in operations to secure a deep objective.

(b) Intelligence acquisition systems have identified an uncommitted MR battalion in Objective 2. The first and second brigades have adjusted boundaries to cover the division's zone; the third brigade has moved forward, anticipating a deep attack into Objective 2. The division plans and begins a divisional offensive operation. Assisted by ground cavalry and air reconnaissance, the third brigade(-), including TF 2-71, attacks to seize Objective 2. The aviation brigade(-) then anticipates blocking the enemy's withdrawal from Objective 2. The brigade commander plans for one ATKHB to conduct a flank attack into Objective 2 while TOW and Dragon teams from TF 2-71 are transported by air assault into positions overlooking likely enemy withdrawal routes. TF 2-71 will then attack Objective 3. It will be assisted by the second ATKHB, which again blocks enemy withdrawal routes. The brigade prepares to conduct similar flanking attacks in depth behind the withdrawing enemy.

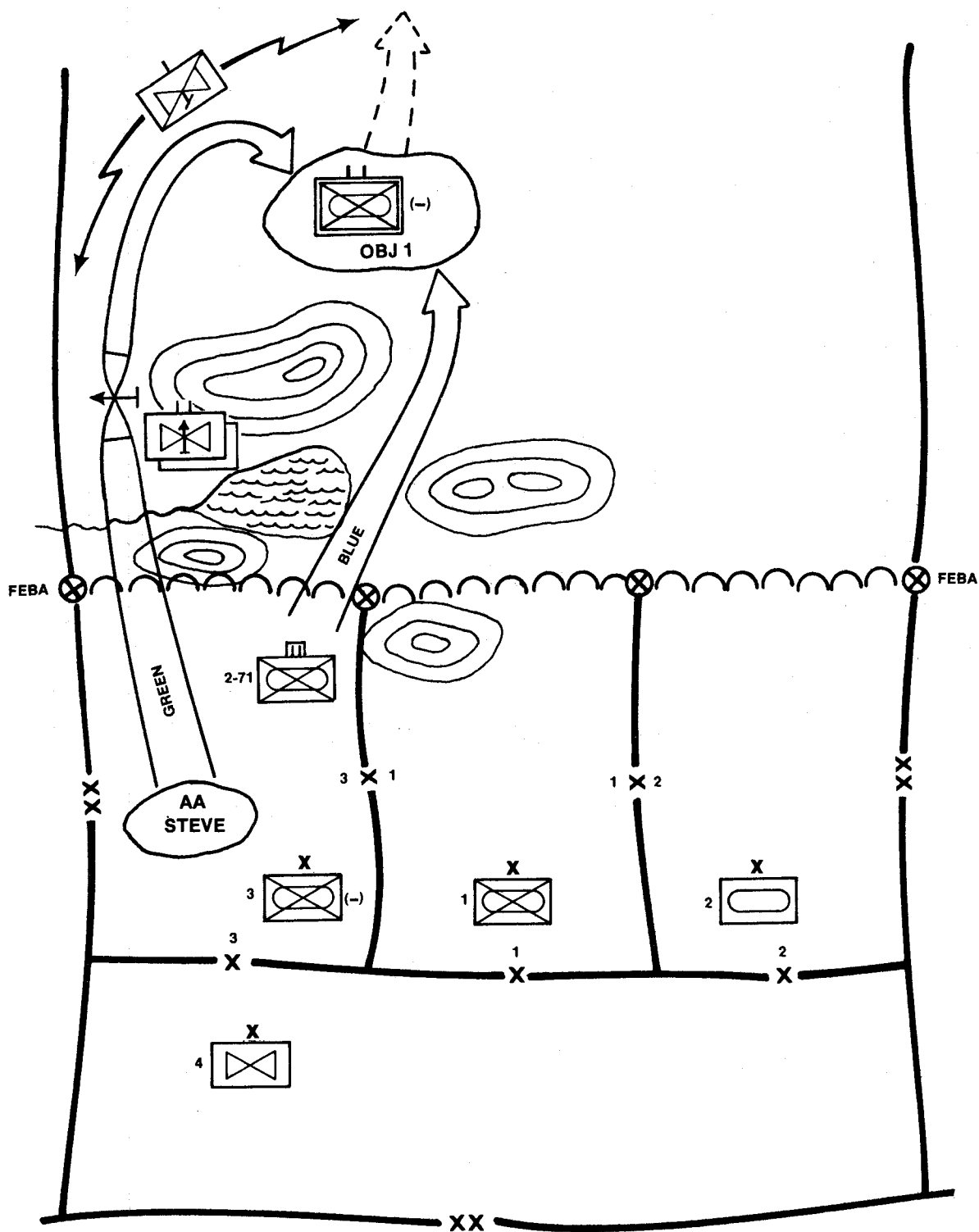
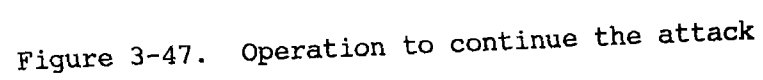


Figure 3-46. Operation to secure a deep objective



(c) Several factors are essential to the success of an operation to continue the attack. These are timely intelligence, mobility, and the availability of--

- CSS.
- Speed.
- Firepower.
- Shock action.
- Effective C² systems.
- Combined arms operations.

3-34. REAR OPERATIONS

The division aviation brigade performs rear operations for aviation brigades at EAC and corps aviation brigades. In future conflicts, combat operations in the division rear area will be an inescapable reality. Threat doctrine advocates the interdiction of airborne and heliborne forces to sever lines of communication, destroy logistics centers, and disrupt C².

a. Aviation Brigade Missions. The aviation brigade gives the division commander a highly mobile and lethal combat force to respond to a Level III incursion in the division rear area. As a maneuver headquarters, this brigade can be tasked as the tactical combat force to initially respond to a Threat incursion. Its assets can also be task-organized with other combat forces to support combat operations in the division rear area. FM 71-100 outlines specific procedures for conducting rear operations at the division level.

(1) Tactical combat force mission. Rear operations depend on an immediate response with the firepower and assault forces to either destroy the Threat or contain it until ground forces can react. The aviation brigade gives division and corps commanders this rapid response force. When designated as the TCF, the aviation brigade should be task-organized with enough combat power to defeat a battalion-size or larger Threat force.

(2) Task organization. Figure 3-48 illustrates a possible task organization of the aviation brigade to conduct rear operations. The aviation brigade is only the initial response force to a Level III incursion. If fighting in the rear area becomes protracted, aviation forces should hand over the battle to a ground maneuver force. The handover will release the aviation brigade to pursue operations in the close or deep operations area.

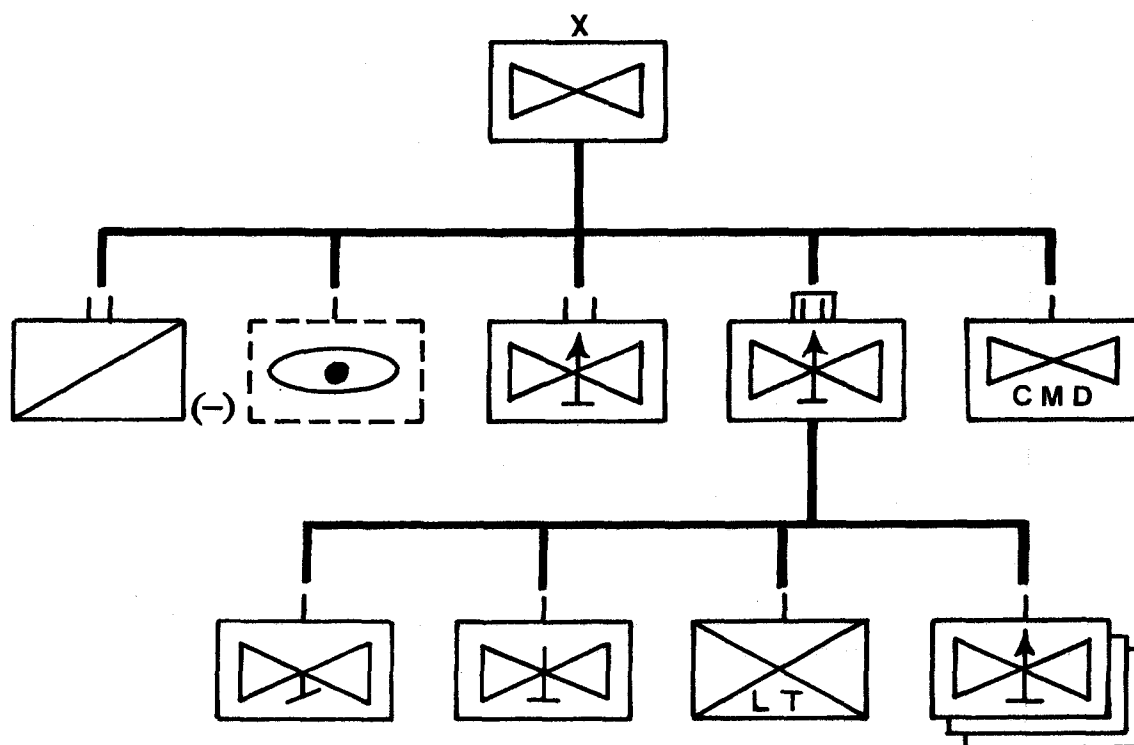


Figure 3-48. ATKHB employment options

b. Cavalry and Air Reconnaissance Squadron Roles. The roles of the cavalry and air reconnaissance squadrons in rear operations are similar to their roles in deep and close operations. Ground and air assets will conduct reconnaissance and screening operations to meet the commander's scheme of maneuver for rear operations, as described in FMs 1-117 and 17-95.

c. ATKHB Roles. The maneuver and mobility capabilities of attack helicopter units give them unlimited potential in rear operations. Among other missions in these operations, ATKHBs can--

- Augment the surveillance capability of the cavalry and air reconnaissance squadrons.
- Conduct counterair operations by attacking the Threat heliborne force while it is airborne.
- Conduct antiarmor attacks against the Threat force once it is on the ground.

- Provide antipersonnel fires.
- Attack the helicopter staging area and FARPs when these targets are identified.

d. AHC Roles. The AHC gives air-assault potential to dismounted maneuver forces. The AHC also rapidly repositions CS and CSS assets to support rear area operations.

e. Rear Operations Planning. For rear operations planning, the aviation brigade must understand the division commander's priority for protection of the rear area. The brigade also needs to have the division plan for rear operations.

(1) Priority of protection. The priority of protection list includes all critical assets that the division commander has designated to be secured in the rear area. These assets may include C² facilities, ATPs, division reserve forces, MSRs, bridges, and the DSA. The division commander assigns priorities for protection of these assets. The assets are then placed on a standing list in order of precedence.

(2) Division rear operations plan. The rear command post publishes the division rear operations plan. The rear CP is organized like the CP at corps level. The plan contains tactical guidance and assigns the tasks to various elements assigned to protect the rear area. This plan normally is transmitted as an annex to the division OPLAN or OPORD.

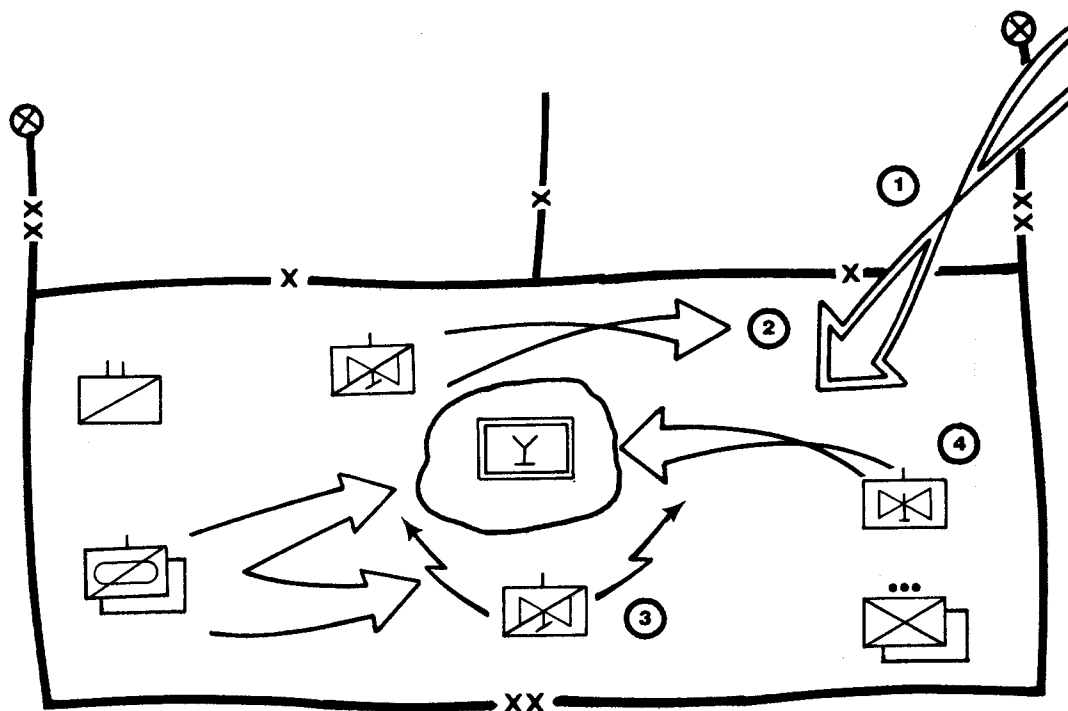
f. Command and Control. C² of rear operations rests with the division rear commander and the rear CP. All bases and base clusters and the TCF report to the rear CP when the rear operations plan is executed. To tie into this C² network, the aviation brigade establishes voice communications with the rear CP and sends an LO to assist in aviation planning at the division level. Once rear area operations commence, the unit initially responding to a specific location establishes voice communications with the base or base cluster nearest the Threat incursion.

g. Tactical Employment. Figure 3-49 shows an example of rear operations. It illustrates the tactical employment of the aviation brigade in response to a Level III incursion into a division rear area.

(1) The aviation brigade has been given the mission to initially respond to a Threat incursion as the division's TCF. A Threat heliborne force has been identified en route to an LZ astride a major ground avenue of approach into the division rear area.

(2) At first, the aviation brigade may respond with the cavalry squadron if task-organized. One of the squadron's air troops makes contact with the enemy flight along the northeastern boundary of the division. This air troop strips away some of the escort aircraft; however, it is unable to stop the force before it reaches its objective. The squadron is moving its

ground cavalry troops to blocking positions along likely avenues of egress from the landing zone. The squadron is also establishing a screen with its remaining air cavalry assets.



LEGEND:

- ① Air troops detect incoming forces.
- ② Reaction forces are alerted, and LZ location is reported.
- ③ Air troops harass the enemy with direct and indirect fires and maintain contact.
- ④ Reaction forces destroy or capture enemy forces. These forces may include ATKHBs/ground units such as cavalry/air reconnaissance, mechanized infantry, or armor or a combination these.

Figure 3-49. Rear operations

(3) The ATKHB task force is alerted; it launches one attack company to provide additional firepower for isolating the force on the ground. The battalion will cycle its remaining two attack companies, as necessary, to sustain operations.

(4) An AATF, consisting of dismounted forces and elements of the AHC, has been ordered to conduct blocking operations in the area. Also, assault helicopter assets have been tasked to move the three mortars of the cavalry squadron into positions to provide indirect fire for the operation.

(5) C² aircraft from the CAC have been assigned to establish a tactical CP. This CP will control the fight.

(6) If this initial response is not enough to defeat or contain the Threat, then more ground maneuver forces are committed. Then, the aviation brigade hands over the battle to the ground maneuver force. Thus the brigade is freed to respond to other contingencies throughout the division area of operations.

Section IX

SPECIAL-PURPOSE OPERATIONS

3-35. TYPES OF SPECIAL-PURPOSE OPERATIONS

Aviation brigades provide responsive assets for special-purpose operations during close, deep, and rear operations. These brigades perform--

- Reconnaissance-in-force.
- Attacks from a defensive posture.
- Raids.
- Deception operations.
- Offensive relief.

3-36. RECONNAISSANCE-IN-FORCE

The reconnaissance-in-force is a limited-objective operation by a considerable force. It obtains information and locates and tests enemy dispositions, strengths, and reactions.

a. During the reconnaissance-in-force mission, the commander must be able to exploit any tactical success. The aviation brigade can exploit that success or extricate other forces. However, aviation forces normally are task-organized with other maneuver forces to execute this mission. The mission is normally planned and conducted as a deliberate attack.

b. In this operation, the reserve is an ideal mission for the aviation brigade. Regardless of the terrain, helicopters can be at the desired location within minutes of a request. The speed and flexibility of the aviation brigade are key in employment as a reserve force during reconnaissance-in-force operations.

c. If the call comes to reinforce and continue the attack, AHC assets place troops on flanks to keep the penetration gap open and reinforce leading elements. Air assault forces locate lead ground units in contact and greatly increase the momentum. Attack helicopters also stop, delay, or impede enemy reinforcements after air and ground cavalry forces have located them.

d. In extricating the attacking force, AHC assets extract dismounted troops, soldiers from disabled vehicles, and personnel slowed down by captured prisoners or enemy equipment and weapons. Assault helicopters may move troops from one delay position back to the next. Attack helicopters are very useful in providing overwatching fires while armor and infantry units disengage and reposition in a delay. They also delay enemy reinforcements from arriving before friendly forces have pulled back across the FLOT.

3-37. ATTACKS FROM A DEFENSIVE POSTURE

There are two types of attacks from a defensive posture. These are spoiling attacks and counterattacks.

a. Spoiling Attacks. Spoiling attacks are mounted to disrupt an expected enemy attack before it is launched. A spoiling attack attempts to strike enemy forces where they are most vulnerable: in assembly areas, in attack positions, during their preparations for the attack while on the move, or before crossing their line of departure. During a spoiling attack, aviation assets may serve as a controlling headquarters with task-organized ground maneuver elements or under another maneuver headquarters. Specific roles include--

- Intelligence-gathering functions conducted by cavalry or air reconnaissance units.
- Attack operations conducted by attack helicopter forces.
- Air assault and air movement operations conducted by assault and medium helicopter units.
- C³I enhancement provided by command aviation assets.

b. Counterattacks. Counterattacks may be conducted either by a reserve or by lightly committed forward elements to defeat an attack. They may be conducted after the attack has been launched, after the enemy's main effort has been identified, and after an assailable flank has been created. In the counterattack, attack assets respond to counter enemy armor penetrations. Assault helicopter units conduct air assault with ground forces to reinforce defensive positions and flanks.

3-38. RAIDS

A raid is a limited-objective attack into enemy territory for a specific purpose other than gaining and holding ground. Raids typically destroy key enemy installations and facilities, capture or free prisoners, or disrupt enemy C² or support facilities. Aviation brigades may be employed pure to conduct a raid with attack assets. Assault helicopter units can be task-organized under a maneuver headquarters to conduct air assault operations as part of a raid.

a. The raiding force must accomplish its mission and withdraw before the enemy can react. The most common raid missions are--

- Rescuing friendly personnel.
- Deceiving or harassing enemy forces.
- Capturing enemy materiel or prisoners.
- Obtaining specific information about the enemy.
- Destroying enemy materiel, installations, or personnel.

b. Aviation brigade assets will not usually move with a ground force preparing for a raid because of mobility differences. However, at times, they may meet the ground force at the objective to add firepower and provide security. Attack helicopters destroy, confuse, and divert the enemy and prevent it from being reinforced while the ground force completes its mission.

c. If a major enemy reaction occurs during the raid, attack and assault helicopters assist in the withdrawal or emergency extraction of the ground force. As with the reconnaissance-in-force mission, adding suppressive fires may hold off the enemy reaction force long enough for the ground force to withdraw. Assault helicopters may be the only available means of extracting the ground force in an emergency because of time constraints and terrain limitations. Attack helicopters can provide security while possibly assisting in the destruction of abandoned friendly vehicles.

d. Conducting the raid solely with helicopters is a natural outgrowth of the technological development in helicopters and changes in doctrine. The raiding force normally is composed of attack helicopter units and AHC assets. However, a pure attack helicopter force may perform a mission to destroy a CP or a MLRS battery. The increasing tactical emphasis on deep operations will cause a greater demand for ATKHBs to conduct raids.

e. During a raid, assault helicopters can insert and extract the raiding force. However, the length of time the force is on the ground makes waiting helicopters vulnerable to attack. Therefore, the force should be inserted by other means, such as airdrop or amphibious landing, and then be extracted by helicopters.

3-39. DECEPTION OPERATIONS

There are two types of deception operations. These are feints and demonstrations.

a. Feints. A feint is a supporting attack. It diverts the enemy's attention from the main effort. Cavalry or air reconnaissance or attack helicopter units normally conduct feints on a limited basis. A feint usually occurs before or during a main attack to deceive the enemy. This deception causes the enemy to move its reserves and shift its fire support to meet the

feint; thus the main attacking force would meet less resistance. During defensive operations, feints are often used independently to keep the enemy moving and to disrupt its preparations for an attack. A series of feints also harasses and confuses the enemy. In some cases, feints cause the enemy to become careless. Units must execute the attack violently to convince the enemy that the feint is the main effort. If the feint penetrates the enemy's defenses, the commander may exploit his unexpected success with follow-on forces or change the course of the main attack to follow the feint. Planning for such contingencies must be made well in advance. The feint does not need to penetrate the FLOT to be effective. A violently executed attack may still cause the enemy to move its reserves and other main forces to the threatened sector.

(1) The feint must appear to be a serious attack. Therefore, helicopters normally associated with an attack must be present. Attack helicopters attack flanks to prevent enemy troops from moving to reinforce the threatened sector. After a breakthrough, they increase the momentum of the attacking force by destroying enemy forces and containing bypassed pockets of resistance. Attack helicopters also participate in the initial attack.

(2) If an unexpected breakthrough is to be reinforced by deploying the reserves or altering the main attack route, helicopters are particularly useful. In either case, the momentum of the attack must be maintained until reinforcements arrive. Meanwhile, assault helicopters move dismounted troops and supplies to the lead unit in contact. Attack helicopters impede, destroy, or delay enemy reinforcements. They also aid the lead ground units in contact by increasing the rate of advance. Cavalry or air reconnaissance forces continue to screen flanks. These forces also report movements of enemy forces and critical information from all sectors.

b. Demonstrations. A demonstration is a show of force in an area where a decision is not sought. A demonstration threatens attack but does not actually make contact with the enemy intentionally. Any element of the aviation brigade can conduct a demonstration. Assault helicopter assets accompanied by cavalry or air reconnaissance or attack aircraft create an ideal demonstration that may appear to be an air assault operation.

(1) Demonstrations serve the same purpose as feints even though no contact is made with the enemy. Demonstrations lack the realism of the feint; but the absence of physical contact with the enemy makes it easier to employ the demonstration force elsewhere. Like all deception operations, demonstrations require a thorough knowledge of the enemy and its collection sources and integration with friendly plans.

(2) Under normal battlefield conditions, the noise associated with helicopters is a liability. In demonstrations, however, it is the noise that makes helicopters so useful. Helicopters are an effective tool in limited visibility; the noise of moving helicopters, plus a soldier's natural tendency to exaggerate the enemy's numbers, makes this tactic successful. Demonstrations vary greatly in execution.

(3) To convince the enemy that friendly forces are moving from one staging area to another, the aviation brigade may use several empty helicopters to make repeated landings and takeoffs from a likely location. This activity is combined with vehicular noise; it may be done at night or during adverse weather conditions. As enemy listening posts detect this noise and as enemy radar catches momentary blips moving in the same direction, the enemy may well conclude that a large redeployment is taking place.

(4) In an amphibious assault on an island or a peninsula, helicopters may make repeated landings at one location. These landings may cause the enemy commander to draw some of his forces away from the true assault objective.

(5) Helicopters may also be used to sling-load an artillery section into a flank or a deep location for a demonstration. On a nonlinear battlefield, several scenarios may be feasible without directly engaging the enemy. A few artillery pieces that are firing from a decisive sector are located accurately by the enemy via radar, crater analysis, or sound sensing. The enemy may mistake this firing for a much greater activity taking place. Also, removing an artillery section before an enemy attack may cause the enemy to move its combat forces in another direction.

3-40. OFFENSIVE RELIEF

An offensive relief passes fresh troops into the attack to maintain offensive momentum. In an offensive relief, aviation brigade forces conduct raids, feints, and demonstrations to distract the enemy from relief positions. Attack and cavalry or air reconnaissance forces provide overwatching fires; CAC assets provide uninterrupted C³I during the relief.

Section X

SPECIAL OPERATIONS

3-41. SPECIAL OPERATIONS EMPLOYMENT

Aviation brigades may be tasked to conduct special operations. The brigades may have to provide assets to operate in lieu of or augment special operations aviation forces. Aviation brigades can operate with precision day or night and in adverse weather. The brigades will conduct special operations across the spectrum of conflict.

3-42. SPECIAL OPERATIONS AVIATION

Army SOA provides several capabilities in support of special operations missions.

a. Purpose. SOA will support special operations by providing dedicated special operations aircraft. These aircraft will clandestinely penetrate enemy lines or cross national borders into denied areas. These aircraft will

operate with precision day or night and during marginal weather conditions. They will insert, resupply, or extract special operations forces and other units as the theater commander directs. SOA units plan, conduct, and support SO unilaterally or with other services in all theaters at all levels of conflict. SOA aircraft are air transportable and strategically self-deployable; they can conduct joint shipboard operations. They may also be configured for MEDEVAC, SAR, attack, mine dispensing, and IEW support operations for SO missions.

b. Missions. SOA will support the missions identified below.

(1) Unconventional warfare. In UW, special operations aviation--

- Augments the NCA's ability to influence operations.
- Conducts air movement of US and host nation personnel and supplies into and out of operating bases.
- Extracts US or allied personnel recovered by the UW escape and evasion network.
- Provides clandestine air movement and fires behind enemy lines.

(2) Direct action. SOA units can insert SO units from austere locations or naval vessels. These SO units may range from a tactical reconnaissance team up to a ranger battalion for missions deep behind enemy lines. SOA air movement support during direct-action operations includes--

- Raids, ambushes, seizure of key facilities, interdiction of major lines of communication, deception schemes, and show-of-force operations.
- Aerial weapons fire for UW, to include terminal guidance of conventional weapons.
- Limited forward air control activities for joint and allied tactical air support. These activities consist of the recovery of sensitive items of equipment, evacuation of captured enemy personnel, and liberation of captured friendly personnel. Also included are other activities that may be specified by the theater commander.

(3) Special reconnaissance. SOAs can assist US, allied, or indigenous reconnaissance elements in their infiltration by air into denied areas. Thus theater commanders can gain timely, strategic intelligence on enemy locations, intentions, and actions.

(4) Psychological operations and civil affairs. SOA assets can support commanders by immediately responding to assist PSYOP and CA needs when other aviation assets are unavailable. SOA could be used when the friendly country is landlocked by hostile nations and unfriendly territory must be crossed to support low-visibility PSYOP or CA operations.

(5) Foreign internal defense. FID operations develop political, economic, psychological, and military infrastructures of friendly governments to prevent or defeat an insurgency. SOA assists by providing aviation forces to host nation forces. These aviation forces can--

- Move civic action teams and materiel.
- Access remote areas.
- Provide health program support.
- Advise and assist in aviation matters.

(6) Combating terrorism actions. The rapid deployment and unique air movement potential of SOA are suited to support time-critical combating terrorism actions directed by the NCA. SOA conducts air movement for counterterrorism operations similar to direct actions. SOA inserts or extracts SOF directly to or from CT targets or supports the seizure of key facilities during other CT operations.

(7) Theater search and rescue. SAR missions are conducted jointly or solely by SOA assets at any time. SOA participation in SAR missions is determined by available resources and mission criticality.

(8) Humanitarian assistance. Aviation support of humanitarian operations involves providing air movement for relief operations. Normally, this air movement conducted by conventional aviation assets includes--

- Distributing food and medical supplies.
- Providing security.
- Performing sanitation services.
- Assisting host nation populations and refugees following natural or man-made disasters.
- Conducting low-visibility humanitarian operations when the friendly country is landlocked by hostile nations and unfriendly territory must be crossed.

(9) Special activities. Other activities may be specified by the President or Secretary of Defense. SOA has unique clandestine airlift capabilities and a rapid deployment capability. These can support SOF and increase the NCA's options in responding to time-critical worldwide crises.

c. Employment Considerations.

Because of the specialization and unique design of SOA units, the commanders and staff must analyze employment considerations before assigning SOA missions. Considerations should include--

- Integrating SOA units into the initial stage of mission planning.
- Exploiting capabilities of other services to increase the effectiveness of SOA.
- Capitalizing on intelligence-gathering capabilities of other sources.
- Suppressing enemy acquisition means.
- Exploiting surprise.
- Exploiting mobility.
- Using terrain for survivability.
- Displacing elements often.
- Exercising staying power.

d. Organization, Capabilities, and Limitations. SOA units are designed to plan, conduct, and support special operations unilaterally or with other services in all theaters and at all levels of conflict. When deployed, SOA assets are under the operational control of the CINC's theater special operations command and are commanded (less OPCON) by the theater army special operations command. SOA units are employed in and assigned to a range of environments and missions. Therefore, an SOA task force normally is formed for specific missions and theaters. Depending on the theater of employment and the level of conflict, this force may be tailored to meet a variety of missions. Figure 3-50 depicts a typical SOA task force.

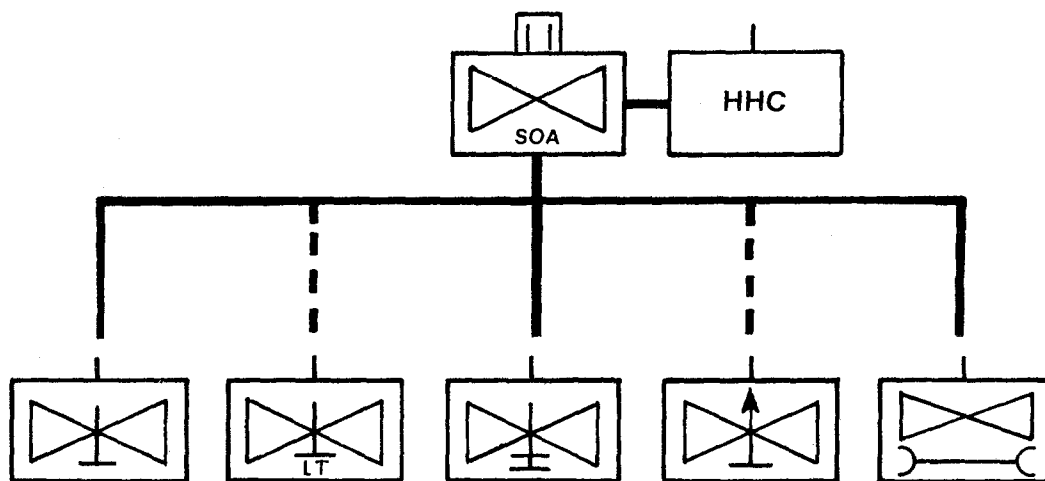


Figure 3-50. Typical SOA task force

(1) Unit organization. The SOA battalion or task force is organized as described below.

(a) Headquarters and headquarters company. The HHC consists of a company headquarters, a command section, a primary staff section, and a signal platoon.

(b) Aviation maintenance company. The AMC consists of a headquarters section, a production control section, an avionics section, a service section, a supply section, a maintenance platoon, an armament platoon, a shops platoon, and a technical supply platoon.

(c) Attack helicopter company. The ATKHC consists of a command section and three attack helicopter platoons.

(d) Light observation helicopter company. This company consists of a command section and three observation helicopter platoons.

(e) Assault helicopter company. The AHC consists of a command section and two assault helicopter platoons.

(f) Medium helicopter company. The medium helicopter company consists of a command section and two medium helicopter platoons.

(2) Capabilities.

(a) Headquarters and headquarters company. The HHC plans for and supports SOA and SO missions. The staff issues plans and orders to control and direct operations for the SOA and support elements attached to the TF. An A²C² element coordinates airspace control measures through the TASOC. It also integrates the A²C² plan with the theater plan. The company headquarters provides mess and signal support.

(b) Aviation maintenance company. The AMC provides an organic capability for routine servicing and aircraft maintenance with its AVUM-oriented assets. The AMC must be prepared to conduct aircraft maintenance at austere forward locations. Its additional AVIM capability provides one-stop maintenance and repair parts supply from a Special Forces Operational Base. The specialized airframes and advanced avionics will require detailed support unique to these airframes. This support must come from its own stockage and from preplanned stockage at theater level.

(c) Attack helicopter company. The ATKHC supports the TF with dedicated attack assets. These assets can be integrated into the plan to provide firepower. Attack helicopters may--

- Conduct antiarmor and antipersonnel operations and attack and destroy critical enemy air defenses, C² nodes, and logistical support bases.
- Provide laser designation for tactical air support or other precision-guided munitions.
- Perform unilateral direct-action operations.
- Perform air combat, air security, and reconnaissance missions.
- Conduct screening operations during direct actions and counterair operations.

(d) Light observation helicopter company. This company provides the TF with dedicated observation, surveillance, and reconnaissance assets. Light observation forces may--

- Conduct reconnaissance and screening operations.
- Secure LZs or PZs.
- Provide laser designation for precision-guided munitions employed by Army and tactical air support assets.
- Enhance C³I operations; for example, provide airborne communications.
- Provide immediate intelligence to the NCA, theater CINCs, and TF commander.
- Insert or extract small strike teams or direct-action forces.
- Monitor and jam Threat radar.

(e) Assault helicopter company. The AHC can insert, resupply, and extract the TF. Assault helicopter units may--

- Conduct aerial delivery of mines.
- Perform limited aeromedical evacuation.

- Conduct external and internal transport of logistics and equipment.
- Enhance C³I.
- Perform reconnaissance operations.

(f) Medium helicopter company. The medium helicopter company conducts long-range clandestine penetration operations into and from denied areas to insert, resupply, and extract SOF. They may--

- Deploy special weapons.
- Conduct limited recovery of downed aircrews and aircraft.
- Conduct external and internal transport of logistics, equipment, and personnel in support of SOA TFs and SOF.
- Perform FARP operations.
- Evacuate mass casualties (24-litter capability).
- Insert or extract battalion-size SOF units.
- Perform logistical air movement of crucial supplies from SFOB to FOBs.
- Perform special operations helocast and water recovery.

(3) Limitations.

(a) Headquarters and headquarters company. The HHC has a limited ability to transport its organic elements. It depends on other units for deployment and movement once in the theater of operations. It contains a signal platoon; however, it may need augmentation from external assets to increase the communications capability of the TF.

(b) Aviation maintenance company. Like the HHC, the AMC depends on other assets for its deployment and movement once in the theater of operations. This unit is designed to be employed in a secured area so that maintenance can be performed. This organization is limited in its ability to provide local unit security.

(c) Attack helicopter company. The ATKHC expends a great deal of Class III(A) and V(A) supplies during prolonged operations. During self-deployment, the wingstores must be modified to permit the use of external fuel tanks. Thus the wingstores must be reconfigured before the attack assets are committed in the theater.

(d) Light observation helicopter company. This company will place increased demands on the TF in maintenance, fuel, and ammunition. It will depend on other assets from the theater for its support. This company has limited range and lift capability. It also is dependent on intratheater military airlift to transport light observation helicopters over great distances from the COMMZ to forward sites.

(e) Assault helicopter company. The AHC is vulnerable to engagement if detected. Using terrain flight techniques and limited illumination and visibility, coupled with a comprehensive ASE system, will enhance the survivability of the unit. The force requires additional aviation assets for security when the enemy is likely to be able to detect the unit.

(f) Medium helicopter company. The medium helicopter company has a limited firepower capability. Additional assets for security must be planned when security of the unit is in doubt. Sling-load operations should be conducted only when necessary; they should be restricted to environments in which the Threat has a limited AD capability. Large amounts of Class III(A) supplies are required. These supplies must be planned in detail. Extensive support is also required from external assets.

e. Command and Control.

(1) Command and control organization. C² organization must be formalized and centralized for both CONUS-based and forward-deployed SOA units. CONUS-based C² systems exercise command over all Active Component SOA, less operational control of designated units performing missions for other agencies. When deployed forward, SOA (especially C²) units must be flexible enough to conduct operations in any intensity of conflict within their assigned theater and, if ordered, peripheral areas.

(2) Command relationships. SOA assets are controlled in a theater by the theater special operations command. These assets are assigned to the TASOC. The TASOC provides an interface among theater army, theater SOC, and SOA units (Figure 3-51). Whenever possible, SOA units should collocate the C² elements with special operations units for mutual support and coordination of the special operations mission.

(3) SO missions. SOA unit C² organizations must have the expertise and resources to receive, plan, and direct SO missions. Coordinated intelligence, accurate communications, and administrative and logistics functions that support SOA help produce dividends worth the risk of undertaking such missions.

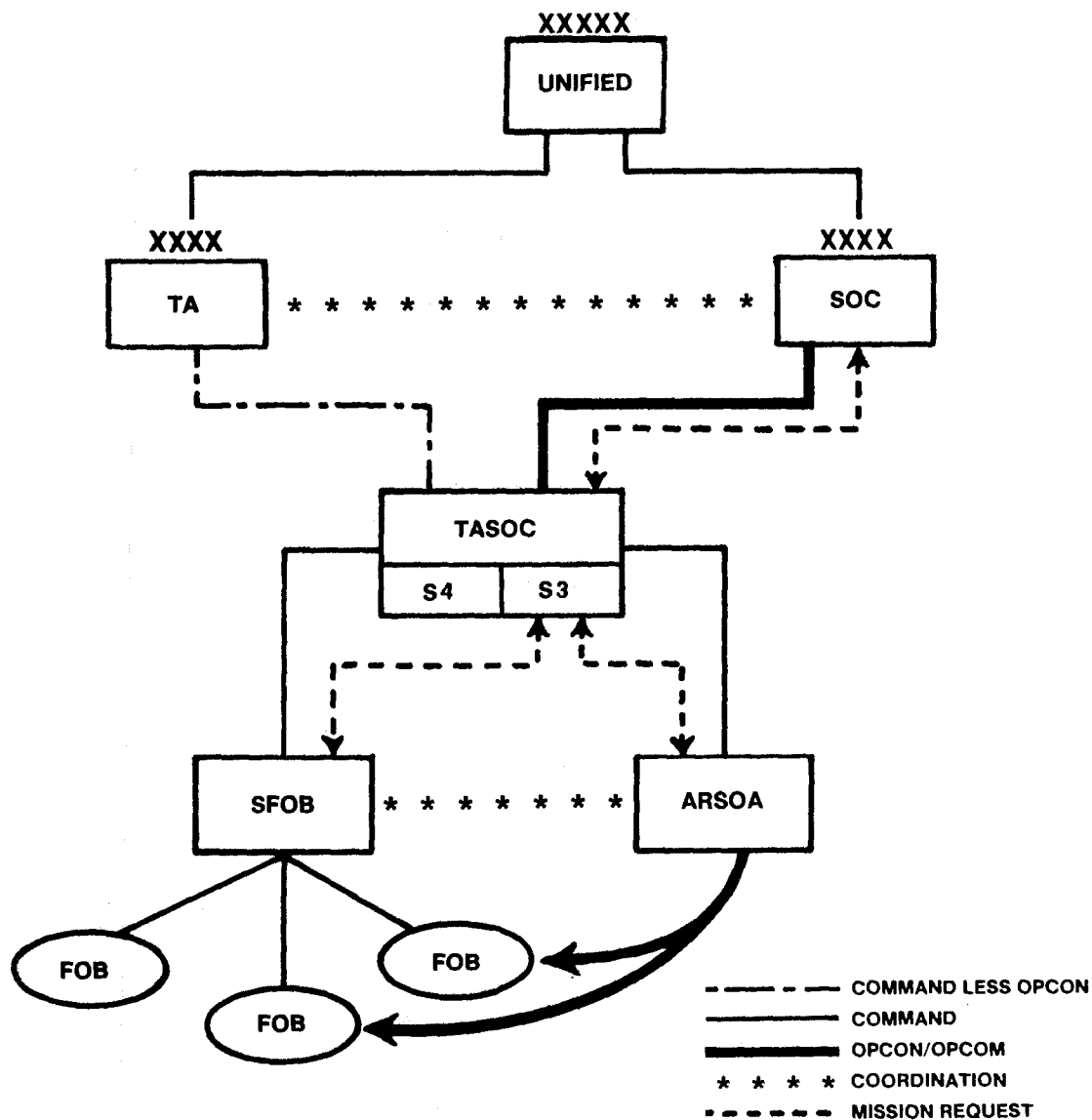


Figure 3-51. TASOC interface among TA, theater SOC, and SOA units

(4) Unique C² functions.

(a) SOA and SO commanders should jointly coordinate and use a combined effort throughout SO mission planning. SOA C² organizations must establish liaison laterally and vertically throughout the theater to coordinate--

- A²C².
- Deception plans.
- IEW schemes.
- Logistics requirements.
- MEDEVAC.
- Signal procedures.

(b) OPSEC and COMSEC prevent fratricide. They also preclude leaks of valuable information to the enemy. Initial assessments (penetration studies) on the feasibility of movement to and from an objective area allow for smoother operations with the elements operating in the region, whether they are host nation or US forces.

(c) To anticipate future SOs, the C² elements of the SOA TF should conduct an in-depth intelligence preparation in the theater. A continuous analysis of Threat and friendly battle situations throughout the theater will provide the command elements with information that will enhance the C² characteristics of the area. Accuracy of information is critical.

(d) Critical elements of SOA C² organizations must be able to deploy either intratheater or worldwide (intertheater). They must also be able to conduct operations in modern or austere environments.

(5) Army airspace command and control.

(a) SOA A²C² coordination will be critical. As a user of the TA airspace and as an additional player in the scheme of action, SOA must maintain liaison between the TASOC and aviation brigades. Because SOA may stage from locations on the theater periphery, coordination and knowledge of theater, corps, and divisional missions are essential. A²C² is the Army's operational approach to coordinating airspace.

(b) The airspace in which aviation maneuvers has become increasingly saturated. New weapons technology and the lower operational altitudes of tactical aircraft require C² measures that will maximize combat effectiveness without impeding the maneuver or fires of friendly forces. A²C² enhances joint and combined arms effectiveness by coordinating employment of airspace users and synchronizing time, space, and purpose. Thus a land component commander must consider the use and control of the airspace above the unit's areas of operations in his tactical or operational plan.

(c) Coordination with potential airspace users of ground and air maneuver in executing battle plans must be simple, flexible, and as near real time as possible. SOA forces should be able to receive Threat cuing and weapons control status data at any point from the COMMZ to forward area tactical AD assets. This will ensure effective Threat warning and enable forces to avoid fratricide.

(d) Current and future airspace operations must be conducted, integrated, and synchronized with other friendly combatant forces to avoid airspace conflicts with--

- Fire support operations.
- IEW aerial reconnaissance, observation, and targeting operations (piloted and UAV).
- Tactical AD operations.
- Aviation and ATS operations.
- Joint and combined tactical air and airlift operations.
- Joint counterair, JAAT, and J-SAK operations.
- IFF and SIF operations and procedures.

(6) Air traffic services.

(a) SOA aircrews normally conduct penetration operations in radio silence. They should, however, be aware of the primary mission of Army ATS, which is to facilitate airspace use at all Army operational levels. The tactical support that ATS can give to SOA aircraft includes--

- Navigational assistance.
- Flight-following.
- Air threat warning.
- Weather information.
- Artillery advisories.
- En route navigational structures information.
- Landing area terminal control.

(b) SOA commanders will be able to analyze all of the employment considerations while conducting a mission. ATS elements equipped with portable systems are deployed with joint and combined control teams, pathfinders, or long-range surveillance units to support aviation operations.

These elements enable SOF to dedicate more of its assets to the mission. Important ATS assets can provide SOA with--

- Navigational, drop zone, and landing zone support.
- Remote navigational systems.
- A²C² system interface.
- Weather information reports.
- Air defense threat (warning).
- Coordination of navigational assistance, terminal services, and en route aircraft separation to preclude fratricide.

(c) ATS units must be austere, air-ground mobile, and modular for flexible, tailored employment based on the situation. They are capable of data/voice communications with appropriate sister service elements, all airspace users, and aircraft in all mission profiles. They should also be capable of communications with the SOA aircraft with the latest communication systems (trans-spectrum, laser/multispectrum communication techniques). All ATS mobile and fixed bases are equipped with secure and ECCM-capable communications. ATS can provide support in adverse weather and natural light conditions and at the lowest possible operational altitudes. This communication capability will enhance aircraft survivability and mission accomplishment.

f. Support.

(1) Logistical sustainment. Logistical sustainment for the SOA TF is diverse and complex. CSS is provided to a deployed TF or units by theater GS and DS organizations. Unique SOA repair and replacement components that are not in TA inventories must be supplied from CONUS. Host nation support is the preferred means of meeting support requirements within acceptable risk limits and when the capability exists during operations in an immature theater. Logistics functions that initially cannot be performed in the area of operations will be performed in a third country support base, afloat, in a lodgment area, or at CONUS installations.

(2) Supply. SOA is supplied primarily from the CONUS support base through the supply system. Class III(A) and Class V(A) theater source items are filled by intratheater stocked assets controlled by the TA materiel management center. High-priority and supply requisitions are filled from TAACOM stocked assets. Materiel is distributed to the theater through the ALOC and SLOC. Replenishment requisitions are based on anticipated requirements projected from past demand data. During the sustainment phase, TAMMC will be the principal manager for all combat-critical classes of supply that the SOA receives.

(3) Maintenance. Normally, the host nation provides support when US maintenance support is insufficient or unavailable in an immature theater.

Civilian specialists and technicians (United States, host nation, or third country) maintain complex equipment to the extent possible. In a mature theater, TAACOM maintenance units furnish support on an area basis for maintenance, recovery, and evacuation of nondivisional units beyond unit capability in the COMMZ. The theater AVIM battalion, as a TAACOM unit, provides SOA forces with AVIM and Class IX(A) supply support. AVUM and limited AVIM are conducted by the SOA TF unit maintenance company. AVUM for SOA will be provided at the theater by the theater aviation maintenance battalion. In an immature theater, EAC SOA intermediate maintenance support may be performed by contractual agreement with commercial maintenance facilities. The support may also be performed by a cross-service arrangement with USAF elements located in a third country, by the host nation, or by a combination of these methods.

(4) Transportation. The orderly transition from peacetime to wartime will be accomplished through a wartime movement program developed by the theater transportation brigade (movement control). The operation plan provides for the movement of supplies and equipment from support areas forward to the deployed forces and the retrograde of materiel from these forces. The transportation system connecting CONUS to overseas destinations may be a combination of US commercial, HN civilian and military, and US military carriers. During early stages of hostilities, HN support provides the bulk of transportation services in the COMMZ except for movement control and Army aviation air movement support. As the situation develops, US military transportation is deployed to augment HN or third country support. Army aviation can augment the transportation system to transport personnel, supplies, and equipment. This mission is not a priority of Army aviation. It can be conducted only if aircraft resources are available.

(5) Field services. Field services are split into two groups--essential and nonessential. Essential services include airdrop and GRREG. Nonessential services include clothing exchange and bath, laundry, and baking services. SOA conducts these services according to FM 100-10.

(6) Personnel. Reconstitution operations replace losses of personnel and equipment. SOA units identify requirements and submit requests through the chain of command. The SOA commander must consider the training and qualification of personnel before replacement or reconstitution operations take place.

g. Planning and Direction. SOA will require specific considerations for the planning of any operation. Each of these areas will have a direct effect on aviation elements as they are prepared and deployed throughout their theaters of operations.

(1) Operations security. All measures taken to maintain security and to achieve tactical surprise are considered operations security. OPSEC includes deception, countersurveillance, and countermeasures. OPSEC identifies, eliminates, or controls any friendly indicator that can be exploited by enemy intelligence organizations. OPSEC measures are also taken to maintain security and to achieve strategic or operational surprise. SOA requirements for security and protection are increased because of the clandestine

origin of these missions. Security for SOA must be tailored to the type of mission and location. (FM 1-100 contains more detailed information on aviation OPSEC.)

(2) Continuous operations. New special operations aircraft enable continuous day-night, all-weather aviation operations to be conducted. SOA operations will encompass many flight hours en route to the mission destination. Crew considerations should be addressed before the mission. Host nation support--supply and maintenance--should be considered.

(3) Aviation liaison. Liaison among SOA units, supported units, TASOCs, TAs, and the theater SOC is mandatory for mission-essential items. Coordination measures should be minimal when the mission has been received by the TASOC and mission-essential tasks have been given to the Army SOA element for planning. Liaison among HN supporters for supply drops and communication links should be coordinated from ARSOA to the TASOC.

(4) Air combat operations. All SOA missions are potential air combat opportunities. Air combat is a specified or implied mission regardless of the assigned mission. SOA will have primarily an air security role on SOF missions. As protection to the ground forces, SOA aircraft need to protect all axes of advance, including the air axis, into the target area. Limited offensive air missions, depending on the strategic or operational priority of the target, could be conducted. METT-T will determine the amount of combat power needed for air combat operations.

(5) Suppression of enemy air defenses. Across the spectrum of conflict, commanders at all echelons are faced with an increasingly capable AD threat. The two principal threats to SOA are ground-based AD systems and airborne intercepts by fixed- and rotary-wing aircraft. SEAD affects the operations of all combined arms actions. SOA at the strategic and operational levels acquires the resources (direct, indirect, chemical, ECM) for SEAD that will support the air dimension from the theater campaign down through the engagement. SOA commanders must get involved in the development and recommendation of priorities. Threat AD targets must be neutralized to ensure warfighting success and combat survivability of aviation operations. Figure 3-52 shows the SEAD assets that may be available to the aviation brigade.

(6) Operations in an NBC environment. NBC weapons may be used during all levels of conflict. SOA aircraft are vulnerable to the effects of chemical and biological aerosols or vapors in flight as well as on the ground. Electromagnetic pulse and radiation from nuclear detonation may damage aircraft systems and injure personnel. SOA units must maintain strict OPSEC and COMSEC postures to prevent the Threat from targeting airfields, refueling points, FAAs, PZs, and LZs. SOA units require real-time intelligence and early warning on Threat employment of NBC weapons. Contaminated areas must be avoided and in-flight intelligence continuously updated. Appendix E describes planning considerations for operations in an NBC environment.

DESTRUCTIVE SUPPRESSION

Army:

203-mm howitzer, M110 A2
155-mm howitzer, M109-series, M198
105-mm howitzer, M102, M119

MLRS
4.2-inch mortar
81-mm mortar

Air Force:

F-4G Wild Weasel /F-16 hunter-killer teams

DISRUPTIVE SUPPRESSION

Army:

AN/MLQ-34 (TACJAM) communications jamming
AN/TLQ-17A (TRAFFIC JAM) ground and airborne communications jamming
(EXJAM) hand-emplaced or artillery-delivered expendable
communications jamming (being developed)
EH-60 Quick Fix radio jamming

Air Force:

F-4RF Wild Weasel radar jamming
EF-111 Raven radar jamming

Figure 3-52. SEAD assets

(7) Joint attack operations. While most joint air attacks will be conducted at the conventional level, J-SAKs may be necessary at SOA level. When employed by the TA in mid- to high-intensity conflicts, SOA will attack high-risk priority targets too difficult for conventional assets. J-SAK combines land and air component units against deep targets identified by the joint force commander.

(8) Military operations on urbanized terrain. SOA will be employed along with other elements in urban areas. Operations in an urban environment require different emphases and techniques from those in rural areas. The more compact areas in which urban warfare is typically waged limit aviation employment. Aviation units play a major role during the maneuver phase to isolate, cut off, and seal escape routes to built-up areas. SOA assets will be used against certain strike or direct-action targets. SOA assets will also support the assault phase to gain a foothold and to ultimately allow assaulting ground forces to control key terrain features.

(9) Combat search and rescue. SAR operations will be conducted to save lives, return downed aircrews to duty, and boost soldier morale. Thus SOA must be able to perform CSAR missions across the spectrum of conflict. CSAR requires specialized equipment, personnel, and procedures to effect rescue in hostile territory. Specific methods of recovery will be determined

by the Threat, survivor condition, and types of aviation forces available to execute the mission. Rotary-wing assets are the most effective vehicles for widespread SAR operations. CSAR forces and assets in specially prepared aircraft must be able to conduct operations at extended ranges in all environmental and climatic extremes. Dedicated CSAR aircraft must be equipped with rescue hoists, self-defense weapons, aerial refueling equipment, and high-technology navigation and communications equipment.

(10) Aircrew survivability equipment. Survivability on the modern battlefield depends on many interrelated factors that affect the ability of SOA to sustain combat in a sophisticated AD environment. ASE enhances aviation's survivability on the modern battlefield; complex aircraft systems allow aviation to counter Threat infrared, radar, and laser weapon systems.

(11) Survival, evasion, resistance, and escape operations. The success of a SERE episode is measured by the soldier's ability to return to friendly control and be quickly restored to duty. SERE is especially important considering the time and expense required to replace and train new aviation crew members. The exact SERE procedures to be followed depend on the intensity of conflict, the availability of SAR assets, and the survivor's proximity to Threat forces. SOA must take an active role in the recovery of its downed crew members. The faster that organic aviation assets begin the search for downed personnel, the greater the prospects for their recovery. SOA forces must plan and prepare for SERE operations according to the unit's total mission priorities.

(12) Location of SOA. Planning considerations for the positioning of SOA (Figure 3-53) on the battlefield depend on METT-T and the specific guidance from the NCA. The SFOB will be located in the area that allows forces the best support structure and the quickest reaction to mission specifications while permitting maximum security for the unit and mission. Location of SFOB will be determined by the support structure of units' capabilities to be supported by conventional units or HN assets. The COMMZ will be a viable location for SFOB during wartime operations. SOA task forces will locate near the command structure to which they are under OPCON.

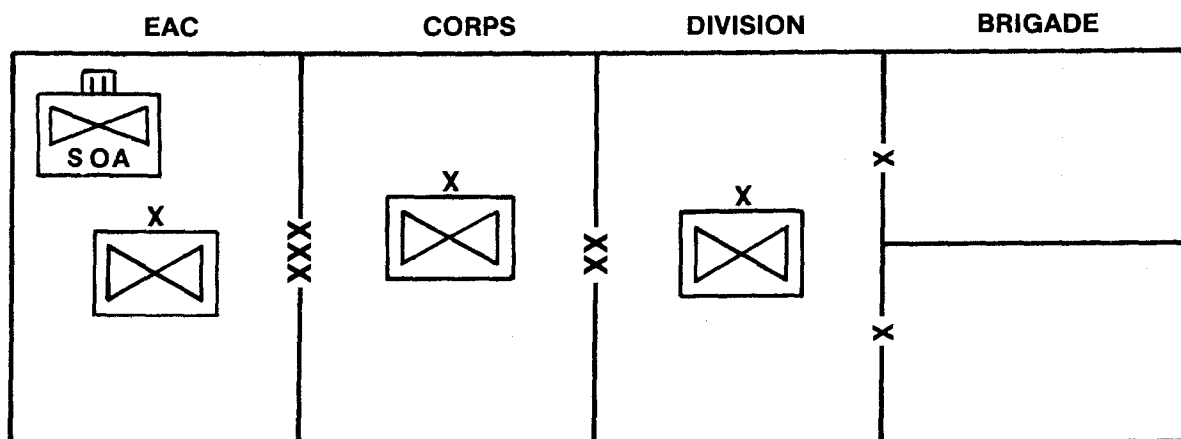


Figure 3-53. Location of SOA task forces

CHAPTER 4

COMBAT SUPPORT

Combat support is vital to aviation operations. Division and corps assets normally provide CS assets for the aviation brigade. When aviation units are under the OPCON of ground maneuver forces, the controlling brigade task force will provide the required combat support. If the aviation brigade operates as a task-organized controlling headquarters for specified missions--for example, a covering force or a screen--additional CS assets may be necessary. This chapter addresses CS assets that may be allocated to the aviation brigade and how they may be employed.

4-1. FIRE SUPPORT

a. Personnel. When provided, the fire support coordinator in the brigade FSE plans and coordinates fire support for the aviation brigade the same as for ground brigades. Normally, the division aviation brigade force structure does not include organic fire support personnel. However, the cavalry squadron has an organic FSO and FSE; ground cavalry troops have organic fire support teams. Each ATKHB (division and corps) has a two-person fire support liaison team. The headquarters element of the corps aviation brigade has no organic fire support personnel. However, fire support planning and coordination assistance is available from the appropriate artillery headquarters.

b. Assets. Various fire support assets are available to the aviation brigade or subunits of the brigade. These assets include field artillery, naval gunfire and air support, and mortars. FM 6-20 further describes fire support in combined arms operations to include priorities of fire and targets and target effects.

(1) Field artillery. Artillery traditionally has three functions: close support, interdiction, and counterfire. SEAD may be supported by any one of these functions. A habitually associated DS artillery unit to support aviation assets does not exist under current TOE force structures. Under certain contingencies, aviation assets could be task-organized with FA in the DS role. A DS artillery unit could be allocated from corps artillery assets or from division artillery units. FM 6-20-2J explains the current division artillery organization; TC 6-40A explains automated cannon gunnery.

(2) Naval gunfire and air support. Naval gunfire and air support can provide the same fire support as field artillery or offensive air support. When naval support is available, the FSE of the aviation headquarters is provided a naval gunfire liaison officer to control the support. If an NGLO is not available, then the FSO, fire support team, scouts, or AFSO must control the naval gunfire and air support.

(3) Mortars. Limited mortar fire support for SEAD during aviation operations may be coordinated and obtained from the supported ground maneuver unit. Mortar sections within the cavalry squadron may also provide mortar support.

(4) Other fire support assets. While it is not their primary role, certain AD weapons (Vulcan and Nike Hercules), attack helicopters, and tanks could provide fire support. The force commander will weigh the consequences of losing a system in its primary role before committing it to a fire support mission.

4-2. SEAD OPERATIONS

In developing a SEAD plan, planners consider the spectrum of combat multipliers available to the commander. A SEAD plan is developed from within brigade, division, and corps assets; however, the execution may involve one or more services. The three types of SEAD recognized across all services include campaign, localized, and complementary. Campaign SEAD operations are preplanned, theaterwide efforts. They are conducted concurrently over an extended period against air defense systems normally located well behind enemy lines. Localized SEAD operations support tactical air operations, Army aviation operations, reconnaissance, and the establishment of corridors for Air Force and Army assets. Complementary SEAD involves continuously seeking enemy air defense system targets to destroy them.

a. Responsibilities. The Army has primary responsibility for suppressing ground-based enemy air defense weapons to the limits of observed fire. The USAF is responsible from beyond the limits of observed fire out to the range limits of Army weapon systems; the Army has secondary responsibility. Even if the USAF can target or observe, the Army may still have to attack the target. Beyond the range limits of Army weapons, the USAF is responsible.

b. Planning. The primary role of the Army in SEAD is based on a "see-kill" principle; enemy air defense systems are attacked immediately upon detection by observed fires. The corps is the primary planning headquarters for SEAD. The tactical air control center coordinates for the USAF. The air support operations center with the BCE coordinates between the Army and USAF. At division and lower, the FSE ensures that the localized SEAD program is coordinated under the direction of the G3. Localized SEAD operations are planned for specific missions. The targets are preplanned; however, they are less precisely located. Otherwise, they would have been candidates for immediate engagements. During local SEAD operations, assets attack targets near the ground target of the air operation and the corridor to and from the target area. This type of SEAD is usually temporary but begins before aircraft arrive at the FLOT.

c. Coordination. The FSE is the focus of SEAD coordination at each echelon of command. Based on the commander's battle plan and METT-T, the FSCoord determines which enemy air defense systems could hinder the mission, how these can be attacked, and what type of suppression effect is desired.

Attack means are aligned with specific types of enemy systems. Acquisition assets are then concentrated--based on IPB and target value analysis--on detecting and locating enemy air defense systems.

d. Techniques. As a rule, artillery is used against targets that are within range and accurately located. IEW support and tactical air support assets suppress targets that are not as precisely located or that are better suppressed by electronic means. Suppression must begin before aircraft arrive at the FLOT; it must continue throughout the crossing of the FLOT. Field artillery is the primary means of suppression. However, mortars, helicopter acquisition devices, electronic jammers, and maneuver units may also execute the SEAD plan.

e. Execution. The commander ensures that his staff uses the system to obtain assets available in the time allotted to execute the mission. Coordination is required at many levels to establish SEAD programs. Aviation commanders need to ensure that their maneuver counterparts are aware that aviation assets should not be employed back and forth across the battlefield on a moment's notice. SEAD planning for cross-FLOT assault or attack helicopter operations includes certain considerations.

(1) The commander's scheme of maneuver initiates the plan.

(2) The process identifies and reveals the threat at the FLOT, en route to the target, at the target, and during the return flight.

(3) Target acquisition assets are tasked to locate suspected or known enemy air defense systems. These assets include UAVs, electronic intelligence, COMINT sensors, and HUMINT assets.

(4) Assets must be allocated to suppress each particular Threat system.

(a) Communications jammers are used to disrupt enemy C² systems at the FLOT and during the entire operation.

(b) Artillery is dedicated to destroying or suppressing those targets within range.

(c) USAF assets are tasked to suppress those enemy air defense systems that are beyond the Army's capability or range or that are better suppressed by USAF assets. These USAF assets include RF-4 Wild Weasel and EF-111 Raven aircraft.

(d) Army aviation assets can infiltrate low level to attack cross-FLOT targets. These targets include air defense systems or critical C² nodes. Army aviation needs to ensure that its weapons mix enables it to suppress targets of opportunity not identified earlier.

(e) Maneuver must be coordinated for the SEAD plan. Because most enemy air defense systems are near the FLOT, a ground attack may need to be synchronized with an air operation to open an air corridor.

(f) Given enough time for insertion, special operations forces could disrupt selected critical AD nodes.

(g) SEAD operations may be required for units returning from cross-FLOT operations along different routes.

4-3. TACTICAL AIR SUPPORT

The USAF performs tactical air operations that can--

- Gain and maintain air superiority.
- Prevent movement of enemy forces into and within the objective area.
- Seek out and neutralize or destroy enemy forces and their supporting installations.
- Join with ground forces in operations within the objective area to assist in attaining their immediate objective.

a. Roles. USAF missions that fulfill tactical air support functions are counterair, air interdiction (to include BAI), CAS, tactical airlift, tactical surveillance and reconnaissance, and special operations. US Army forces, specifically aviation brigades, are normally employed with or may receive support from tactical air assets employed in the following roles:

- Counterair.
- Battlefield air interdiction.
- Close air support.
- Tactical surveillance and reconnaissance.
- Tactical airlift.

(1) Counterair. Counterair missions are conducted to attain and maintain air superiority. However, within the counterair effort, tactical air assets perform SEAD by attacking enemy AD systems through EW or jamming or by destroying them. SEAD missions are normally preplanned. SEAD targets include enemy AD radar systems, surface-to-air missiles, or anti-aircraft artillery. RF-4 Wild Weasel, EC-130 Compass Call, and EF-111 Raven aircraft are part of the SEAD campaign. They can jam or destroy enemy radar and communications.

(2) Battlefield air interdiction. BAI is a subfunction of air interdiction. The objective of BAI is to delay, disrupt, or destroy follow-on forces that may directly or in the near term disrupt ground force operations although land forces are not yet engaged. BAI is normally considered part of deep operations. It is a preplanned mission. However, if the final target location is unknown, all but the final portion of the mission is

planned in anticipation of the final attack coordinates, which are provided NLT two hours before takeoff. Army units may provide a mission-specific request for BAI targets. Thus BAI is preplanned; however, it can be retargeted or directed to an alternate preplanned target. BAI missions are typically flown near the FSCL. Ground forces may nominate BAI targets to be attacked. The targets or BAI missions are prioritized. The Air Force executes the BAI campaign. It attacks targets in order of priority based on the availability of air assets. The F-16 and F-4 are often BAI attack assets.

(3) Close air support. CAS supports land forces by attacking an enemy close to friendly forces. Detailed integration is always required by the land and air forces employing CAS; thus these missions can support the fire and maneuver of the Army. Close air support influences the ground battle by delivering a range of weapons and massed firepower at decisive points. CAS may also be effective in rear operations. CAS missions are flown at the request of ground forces. However, they are controlled by the USAF through the tactical air control system. CAS must be responsive to maneuver forces. It may include preplanned and immediate sorties. A preplanned CAS mission may be scheduled 24 hours before a counterattack that requires the participation of the entire combined arms team. However, an immediate CAS mission may be required when enemy armor or troops attack unexpectedly and the force ratio shifts dramatically. Immediate CAS may arrive as soon as an airborne flight can be diverted to the sector. From a forward operating location, however, a flight may take up to 30 minutes to arrive.

(a) Close air support is normally flown near the FLOT. Because of exposure to enemy fire, CAS aircraft maneuver mostly over friendly territory and employ tactics that minimize their exposure. SEAD greatly improves the success of a CAS mission. Without SEAD support from the Army, A-10 attrition may be unacceptable and preclude additional sorties to and in a particular sector.

(b) Close air support targets are normally maneuver forces within close range of friendly forces. Lucrative CAS targets include moving armor, light-skinned vehicles, and personnel. However, static, camouflaged, and dug-in forces are difficult to visually acquire from an aircraft. The A-10 Thunderbolt and A-7 Corsair are often used as CAS aircraft. Their tight turning ability is essential to attacks and evasive maneuvers around the FLOT. The F-16 and F-4 can also perform CAS.

(c) A special form of CAS is created when CAS aircraft and aviation forces operate together to locate and attack enemy forces. This is a joint air attack team. JAAT missions can be preplanned or immediate. A JAAT is most effective against high-priority, lucrative targets such as an armor force on the move. Artillery and SEAD support may be essential to a successful JAAT attack. Appendix G and FM 1-112 further describe JAAT operations.

(4) Tactical surveillance and reconnaissance. This mission is commonly referred to as "recce" in the Air Force. It provides the air and

ground commanders with photographic and electronic information about the location, disposition, and actions of enemy forces. It can also assess the effectiveness of air and ground attacks to determine target status and future operational requirements. The RF-4 also performs tactical surveillance and reconnaissance.

(5) Tactical airlift. Tactical airlift provides mobility for ground forces; it can immediately deliver combat troops and supplies. Specific missions include movement of maneuver, CS, and CSS assets between adjacent commands or areas of operations. Tactical airlift also augments aeromedical evacuation, supports special operations, and delivers airborne combat troops. Tactical airlift operations are conducted primarily with C-130 aircraft.

b. Command and Control.

(1) Air component commander. The air component commander is responsible for the entire theater air battle. The ACC must be able to mass his forces and conduct a variety of tactical air operations. The ability to shift or mass forces calls for centralized control; in contrast, detailed mission planning and execution demand decentralized execution. The ACC implements the principle of centralized control and decentralized execution using the management tool of the tactical air control system. He commits the forces under his operational command according to his broad plan of action and the threat.

(2) Apportionment and allocation. Air apportionment is the responsibility of the joint force commander. It is the determination and assignment of the total expected tactical air effort by percentage or priority that should be devoted to the various tactical air operations or geographic areas for a given time. Apportionment is based on priorities established by the joint force commander during consultation with the subordinate commanders; thus limited assets are optimally distributed to perform a variety of missions. Apportionment depends on the threat and mission objective. The tactical air effort is apportioned, in order of priority, among the following missions:

- Air interdiction (to include BAI).
- Counterair.
- Close air support.
- Tactical reconnaissance.
- Tactical airlift.
- Special operations.

Once the apportionment has been made, the air component commander allocates the assets. Allocation is simply the conversion of the apportionment percentages into the number of sorties for each operation. This step includes

specifying the sorties to strike approved BAI targets and the sorties available for CAS.

(3) Tactical air control system. The TACS and its senior control element, the tactical air control center, serve as the command and control system. Through this system, the ACC establishes and exercises control over his assigned forces.

(4) Tactical air control center responsibilities. As the operational focal point of the TACS, the TACC allocates the joint force commander's apportionment of assets by determining the number of sorties by the type of aircraft available for each operation. Personnel at the TACC, coordinating with the battlefield coordination element, select--

- Units.
- Ordnance.
- Weapon systems.
- Times on target.
- Force package composition.
- Associated details of tactical air control arrangements.

The TACC dispatches air tasking messages and orders to the flying units, the air support operations centers located at the corps headquarters, and other agencies of the TACS. A BCE coordinates planning with the TACC. The BCE is composed of about 28 Army personnel.

(5) Tactical air support agencies. Two TACS agencies, other than the TACC, provide responsive tactical air support. These agencies are the ASOC and the TACP.

(a) Air support operations center. The ASOC plans, coordinates, and directs tactical air operations in support of ground forces. It is collocated with the senior Army tactical operations center, normally at corps. It provides fast reaction to immediate requests for tactical air support.

(b) Tactical air control party. The TACP consists of USAF personnel experienced in airlift, reconnaissance, and fighter operations. TACPs are assigned at each Army echelon down to the brigade; the senior officer is designated the air liaison officer. The ALO advises and assists the ground commander and requests and coordinates tactical air support. The tactical air coordinator (airborne) assigned at each battalion or squadron controls CAS aircraft. Aviation brigades are normally not organized with organic TACPs; however, they will often receive their assets for a specific mission or time. Aviation brigades often operate with tactical air support assets and require TACP coordination and synchronization.

(6) Tactical air support requests.

(a) Requests for tactical air support are divided into two categories: preplanned and immediate. A preplanned request is a request for air support when time is available for detailed mission coordination and planning. These requests are forwarded through Army channels for final Army approval. An immediate request is a request for air support when there is no time for planning. Immediate requests for tactical air support are forwarded through USAF channels on the high-frequency air request net from the TACP directly to the ASOC.

(b) In general, any Army level of command can request immediate or preplanned tactical air support. Any intervening Army headquarters in the request channel can approve the request, substitute another type of support (for example, field artillery), or disapprove the request. In all cases, the requesting agency must be notified if the request is denied. Only ground force commanders or designated representatives can cancel or disapprove tactical air support requests. USAF elements can only advise, manage, and control.

4-4. ENGINEER SUPPORT

a. Brigade Engineer. When engineers support aviation assets, the commander of the engineer unit serves as the brigade engineer. He advises the commander on the use of the engineers and their equipment. The engineer estimates unit capabilities, materiel support requirements, and the time required to accomplish the mission. The brigade engineer is the commander's single point of contact for engineer support.

b. Functions. Engineer units can support the aviation brigade in various ways. These include mobility, countermobility, survivability, topographic, and infantry support.

(1) Mobility. Mobility support is primarily forward aviation combat engineering tasks such as clearing LZs and constructing assault air strips. Engineers may support aviation with countermine, counterobstacle, and gap-crossing tasks. However, aviation will more likely support these tasks during combined arms operations by providing smoke, suppressive direct fires, aerial observation for indirect fires, and troop transport to secure the far side while engineers conduct breaching operations.

(2) Countermobility. Countermobility support is conducting mine warfare and reinforcing obstacle tasks to enhance the effectiveness of engagement areas. Engineers will emplace conventional mines as part of the tactical barrier plan or as a protective measure for static installations such as depots, maintenance and supply facilities, and airfields. Engineers also have ground-emplaced mine scattering systems. With the introduction of Air Volcano, aviation's UH-60s will have a scatterable mine capability. Engineers can assist with training in emplacement and reporting requirements for Air Volcano. Reinforcing obstacles can include demolition of bridges and creation of road craters, construction of tank ditches and log cribs, and atomic demolition. Part of this mission is to delay the enemy and divert it

into selected areas so that maximum combat power can be massed on enemy concentrations. These operations canalize the enemy into killing zones and degrade the enemy's ground mobility, increasing the enemy's time in the engagement area.

(3) Survivability. Survivability is the development of protected positions. Survivability support can be used by aviation to protect CPs, FARPs, and maintenance facilities from enemy observation and indirect and direct fires. Engineers may support aviation with deception operations by constructing decoys and dummy aviation facilities.

(4) Topographic. Topographic support includes map production, map distribution, and terrain analysis tasks. Topographic engineers provide maps of the corps area. The corps has a terrain analysis platoon, which can provide various map overlays such as aerial obstacles and landing zones.

(5) Infantry. Infantry support is action of last resort. For rear operations, the engineers may have an on-order mission to engage the enemy. The engineers will reorganize as light infantry in platoon- or company-size units for possible air assault operations. These engineers will require additional support such as antitank weapons, indirect fire support, medics, and aircraft support. However, using engineers as infantry will stop all engineer work and eliminate their combat multiplier effect. FM 5-100 contains more detail on engineer operations.

4-5. AIR DEFENSE

a. Objective. The objective of air defense is to limit enemy offensive air efforts so that friendly forces are free to act. With the changes in the force structure of the Army and the application of the tenets of AirLand Battle doctrine, the objective takes on a new significance. As organic AD resources that support the maneuver commanders are reduced and with the expected ability of the Threat to mass superior numbers, commanders at all levels will be required to properly allocate and use AD assets. By establishing and continually reevaluating the priorities for air defense, commanders may preserve the combat power of the total force for the decisive moment. Commanders within aviation will be faced with additional burdens. They will be conducting operations within airspace that is heavily congested with both Threat and friendly aircraft. They will also be in an environment of fire support and AD weapons of unprecedented quantity and lethality. Aviation commanders must have an in-depth knowledge of AD resources.

(1) Theater air defense. At theater level, the USAF and high-to medium-altitude air defense usually provide AD protection to the theater commander's assets and the theater as a whole. Resources include allied and USAF counterair aircraft and US Army Hawk, Chaparral, and Patriot SAM units. The availability of these resources will depend on how critical the maneuver commander's battle is to the overall objective. For example, if one division's objective is considered pivotal to the battle, the theater commander will most likely commit CAS and counterair resources to support that division. In this instance, a Hawk battalion can be used in the general support-reinforcing or reinforcing role. Within the division area, the degree of air

defense support to individual brigades will depend on the criticality of their role in the overall division objective. Aviation employed in deep, close, or rear operations should be allocated AD support.

(2) Corps air defense. At corps level, the same principle of allocating AD resources applies as at theater level. Also, changes in force structure dictate the availability and type of AD resources at individual corps. One corps may have one gun and Stinger battalion, three Chaparral battalions, and one Hawk battalion. Another corps may possess two gun and Stinger battalions, one Chaparral battalion, four Hawk battalions, and one Roland battalion. The availability of these resources at the corps provides unprecedented AD leverage to the corps commander. He, in turn, can influence the battle at division level by committing available corps AD assets at the decisive time and place.

(3) Division air defense. At division level, the organic AD (SHORAD) battalion provides air defense protection. The maneuver brigades fighting in close operations must be protected against Threat attack helicopters and ground support fighters. Also, high-priority assets in the rear operations area require protection by limited AD resources. Thus the division, the AD battalion, and maneuver brigade commanders must establish priorities and continually reevaluate defended assets. Aviation assets provide a high degree of mobility, flexibility, and firepower to the division. However, these assets are extremely vulnerable to air attack. The aviation commander must ensure that AD protection for his forces is adequate; also, he must ensure that AD elements are integrated into the air defense plans for every area where the brigade will operate. Forces may maneuver out of their supporting air defenses and into another unit's maneuver area because of the brigade's mobility. The brigade must coordinate with and integrate into the AD system and airspace management scheme of that unit. Overall coordination within the division area with the division's AD battalion commander (division AD officer) will ensure air defense continuity.

(4) Unit air defense. At unit level, the final level of protection for the aviation brigade, passive AD measures are employed routinely and organic weapons are engaged against enemy aircraft. Passive measures reduce the probability of attack and limit damage in case of attack. These measures include--

- Terrain flight techniques.
- Maximum standoff ranges.
- Minimum exposure times.
- Cover, concealment, and camouflage.

If the brigade is not discovered, the probability of being hit diminishes to near zero. If air attack cannot be avoided, the brigade's organic weaponry must be directed against the enemy for self-defense. Commanders should

stress the importance of self-defense for maneuver units. FM 44-8 contains detailed guidance on unit self-defense against air attack. FM 1-101 explains aviation battlefield survivability.

b. Counterair Requirements.

(1) US forces cannot assume that they will always have air superiority. They must be prepared to counter enemy aircraft in all areas of the battlefield, particularly beyond the FLOT. Threat antihelicopter doctrine has improved as friendly helicopter combat effectiveness has improved. One of the priorities of Threat helicopters will be to destroy US antiarmor systems, both in the air and on the ground. The Threat will use fighters, armed helicopters, and all other means to counter US systems.

(2) Army aviation assets must be prepared to contribute to the counterair effort on the modern battlefield. Aviation assets equipped with air-to-air weapon systems will complement ground-based AD systems. Aviation must be able to defend itself against enemy air attacks as well as to defend ground elements against fixed- and rotary-wing aircraft. FM 1-107 describes helicopter counterair operations in detail. Appendix F of this manual addresses air combat planning considerations for aviation brigade staffs. This appendix also covers how aviation brigades assist the counterair effort.

c. A²C² Link. The corps aviation brigade commander on the modern battlefield must coordinate the entry of aviation assets into the Army airspace command and control arena. To limit the risk of engagement by friendly forces, the commander must fully use the existing C³ structure. He must also require his forces to adhere to directed control procedures. A strong link with the A²C² elements at the corps and division must be established and maintained. This link allows information that affects users of the theater airspace to be rapidly disseminated. The A²C² element should provide all pertinent airspace information during planning, as well as coordinate with other users, to prevent conflict throughout the operation. FM 100-103 discusses A²C² in more detail.

d. IFF Systems. IFF systems enable aviation commanders to synchronize their forces with AD units on the battlefield and reduce risk for aviation assets. In practice, corps and divisional AD (SHORAD) units combine IFF and visual identification for engagement. Nondivisional HIMAD units operating near the division rear area do not have this visual capability. Aircraft operating in that airspace will be interrogated and then evaluated against activated airspace control means. If the IFF system is inoperative or turned off or the pilot is unaware of its proper use and codes, the aircraft may be engaged.

(1) Air defense and IFF use by aviation units. Air defense IFF systems, along with aviation assets, are the primary means of identification. These systems should be the main contributor to synchronization among airspace users. Commanders must ensure that IFF equipment in their aircraft is maintained and serviceable and that aircrews are trained to use it. Without the IFF system, aircraft would have to adhere to the procedures for identification outlined in the theater airspace control plan.

(2) Tactical IFF use. The airspace control authority directs the tactical use of IFF within a theater of operation; this authority applies to all airspace users, including Army aviation assets. For example, corps aviation assets, which have numerous missions, may fly within and throughout a division or corps area of operations. Supplementary doctrine is appropriate for brigade assets when they are involved in deep, close, and rear operations.

(a) Deep operations. When aviation assets are involved in deep operations beyond the FSCL, aircrews will turn off the aircraft transponder Mode 4 at the theater-directed IFF OFF line. After completing the mission, returning aircrews will turn on the Mode 4 at the IFF ON line.

(b) Close operations. In close operations, aviation assets must have Mode 4 turned on. Thus friendly aircraft have maximum protection during most combat operations, especially at night or during adverse weather conditions.

(c) Rear operations. Aviation operations in the corps or division rear area will also be conducted with IFF Mode 4 turned on.

4-6. INTELLIGENCE AND ELECTRONIC WARFARE SUPPORT OPERATIONS

Aviation commanders and staffs will obtain support for planning and executing operations from IEW support operations. In the aviation units, the IEW systems consist of the commanders, staffs, IEW support personnel, and other organic and supporting units. The aviation S2 and S3 coordinate IEW operations. They must ensure that the system is responsive to the commander's PIR. IEW systems meet mission demands in three forms of support: intelligence, electronic warfare, and counterintelligence. Figure 4-1 shows a common IEW structure. Figure 4-2 illustrates these systems.

DIRECTOR

FORCE COMMANDER

COORDINATORS

G2 and S2

- Intelligence
- Counterintelligence
- Security

G3 and S3

- Operations
- Electronic Warfare
- Operations Security
- Deception

PRODUCERS

Collection Management

- Prepare collection plans
- Manage collection activities

Analysis

- Intelligence preparation of the battlefield
- Processing
- Intelligence analysis
- Enemy, weather, and terrain data bases

Electronic Warfare Support Measures

- Technical data base support

Operations Security

- OPSEC data base support
- Vulnerability assessment
- OPSEC measures recommendation

Dissemination

- Reports
- Briefings
- Estimates

EXECUTORS

Commanders

- Military Intelligence
- Cavalry
- Artillery
- Maneuver
- Engineer
- All others

Command

- Direct and control organic assets to satisfy requirements

NOTES:

1. The director, coordinators, producers, and executors are common elements of the intelligence and EW structure at each command level.
2. The level of detail for each function varies by echelon.

Figure 4-1. Common IEW structure

IEW SYSTEM					
ECHOLON	PRODUCERS	ORGANIC RESOURCES		ALLOCATED SUPPORT	REQUESTS SUPPORT FROM
EAC	EACIC	MI Bde (EAC) Intg S&T Intel HUMINT CI SIGINT HF ESM			USAF/USN/USMC National Allies
Corps	CTOC Spt Elm	MI Bde Intg CI Spt Voice Coll (VHF) Aerial Noncom Intcp Aerial Comm Intcp VHF ECM (Gnd) Noncom Intcp (Gnd) SLAR, Photo IA Long-Range Survl	↙	CI Spt Tech Intel Intg	EAC USAF/USN/USMC National Allies
Div ¹	DTOC Spt Elm	MI Bn GSR Aerial Comm Intcp/DF/ECM (OPCON) CI Spt Voice Coll (VHF/HF/ECM) HF/VHF ECM Noncom Intcp/DF Intg Long-Range Survl	↙	Voice Coll (VHF) VHF ECM (Gnd) Noncom Intcp (Gnd) Int CI Spt	Corps USAF
Bde	S2/BICC	No Resources ²	↙	IEW Spt Elm ³ Survl Sqd IEW Co Tm C&J Plt CI Spt ⁴ Intg ⁴	Div
Bn	S2/BICC	Scout Plt Troops Patrols		GSR Tm	Bde

¹ACR/separate brigade organic MI company provides support similar to divisional MI battalion adjusted to scale based on the mission.

²Some resources are further allocated to the battalion.

³IEW support element provides interface between MI assets and brigade S2/S3.

⁴This support is available when the corps is augmented.

Figure 4-2. IEW system

a. Intelligence. Battle success depends on the force commander's ability to see the battlefield. Threat forces must be surprised and caught at a disadvantage as often as possible. Their strengths must be avoided and their weaknesses exploited. Thus commanders must have clearly defined areas of operation; they must also understand the conditions in which they will fight and the nature, capabilities, and activities of the Threat. Intelligence operations obtain reliable information about the enemy, weather, and terrain and provide it quickly and completely to the commander.

(1) Intelligence preparation of the battlefield. IPB is a systematic and continuous approach for analyzing the enemy, weather, and terrain. It is the principal tool the aviation S2 uses to predict probable courses of action. Through IPB, the S2 reduces battlefield uncertainties; the commander can then select the best course or courses of action. Figure 4-3 shows a few IPB products and their applications to aviation units.

PRODUCT (Combined Obstacles Overlay)	APPLICATIONS
Combined obstacles (wet/dry) Soil Vegetation Line-of-sight analysis* Obstacles to NOE flight* Lines of communication* Terrain-influenced wind overlays* Cloud coverage* Fog/smoke* Severe weather* IR changeover*	Friendly or enemy avenues of approach LZ/DZ selection Concealment of NOE flight EW, communications, NOE routes, surveillance NOE routes, flight MSR selection All aviation operations NBC operations Air avenues, acquisition Air avenues, fields of fires, radar capability, LOS All aviation and ground operations FLIR, navigation operations
*Denotes key products to aviation elements.	

Figure 4-3. Products and applications of the IPB process

(2) Graphic display and decision support templates. The S2 section of the aviation unit will also provide graphic displays of doctrinal, situational, event, and decision-support templates. The decision-support template is important; it translates intelligence estimates and the operational plan into graphic form. With it, the commander can exploit assailable enemy flanks and select high-value targets for engagement. He can also interdict critical points to force the enemy to abandon a course of action.

(3) Collection management. Collection management by the S2 will be based on those intelligence requirements not answered through IPB. Reconnaissance and surveillance planning must be thorough whether the aviation unit is employed in a covering force or occupying terrain as a combat team. The plan must be updated as the situation changes. Because of the great distance that may be influenced by aviation, the S2 must continuously coordinate with the G2 and the support element in the DTOC or CTOC. The S2 can then predict enemy actions in selected areas of interest. Reconnaissance and surveillance adjustment to those high-value targets will give the commander a time-phased picture of the battlefield. It will also give him options for using critical assets in a timely manner. FM 34-1 further describes collection management.

b. Electronic Warfare. EW is an essential element of combat power. Its contribution lies in exploiting enemy weaknesses, protecting friendly freedom of action, and reducing security and communication vulnerabilities. Modern military forces depend on electronics for command and control of forces and employment of weapon systems. Thus both friendly and enemy forces are vulnerable to actions that can reduce the effectiveness of these devices or gain intelligence from them. EW cannot physically destroy a target. However, it can confuse, deceive, delay, disorganize, and target the enemy when integrated into the overall concept of the operation.

(1) Electronic warfare support measures. ESM involve actions to intercept, locate, and identify Threat sources. ESM provide combat information for the S2 to meet the commander's requirements for fire support, plans, maneuver, and security of forces. The S2 must establish priorities for ESM orders and requests. He continuously coordinates the operations of MI resources through the IEW support element.

(2) Electronic countermeasures. ECM involve actions taken to prevent or reduce the use of the electromagnetic spectrum by hostile forces. The aviation S3 has staff responsibility for overall planning and coordination of EW operations. He primarily directs the ECM in jamming and deception roles. With the S2, FSO, and IEW support element, the S3 will establish priorities for targets. ECM are taken against those targets to degrade the enemy's ability to respond quickly and effectively.

(3) Electronic counter-countermeasures. ECCM involve actions taken to retain friendly use of the electromagnetic spectrum. The S3 will coordinate with the signal officer to establish ECCM to protect friendly signal operations. Training in the employment of the emitters and about the emitter design is necessary for ECCM. FM 34-1 gives the commander and his staff more details on IEW.

c. Counterintelligence. CI is that activity intended to detect, evaluate, counteract, or prevent hostile intelligence collection, subversion, sabotage, international terrorism, or assassination conducted by or on behalf of any foreign power, organization, or person operating to the detriment of the US Army. It includes identifying the hostile multidiscipline

intelligence-collection threat, determining friendly vulnerabilities to that threat, and recommending and evaluating security measures. CI operations support OPSEC, deception, and rear operations.

(1) OPSEC. CI supports OPSEC by focusing on the hostile intelligence threat (HUMINT, SIGINT, and IMINT). CI also assists in developing methods of defeating that threat.

(2) Deception. Deception operations mislead the enemy as to friendly intentions. These operations cause an enemy reaction that assists in achieving friendly objectives.

(3) Rear operations. CI supports rear operations. CI identifies, exploits, and neutralizes rear area threats. These threats include agents, saboteurs, enemy sympathizers, and special-purpose forces.

4-7. CORPS AND DIVISION AERIAL IEW ASSETS

a. MI Battalion (Aerial Exploitation) (Corps). The MI battalion (AE) provides the corps commander with his organic Deep Look system through aerial reconnaissance, surveillance, and SIGINT collection, analysis, and reporting. Looking deep into Threat territory, the battalion finds and follows enemy forces through physical and electronic signatures. It uncovers critical targets that are inaccessible to corps ground-based systems. Through its aerial signal collection and surveillance operations, the MI battalion (AE) provides the commander with information critical for both close and deep operations. Battalion assets include--

- Guardrail for communications intelligence.
- Quick Look for noncommunications intelligence.
- SLAR on Mohawk aircraft for detecting enemy moving target indicators and cameras on Mohawk aircraft for aerial photography.

(1) Guardrail.

(a) Capabilities. Guardrail provides collection and emitter location information on Threat communications. It intercepts enemy VHF, UHF, and limited HF communications emitters. Guardrail also provides locational information on HF and VHF emitters.

(b) Mission. Two or three aircraft are normally employed for each mission. These aircraft fly over friendly controlled areas in a stand-off mode. The nature of the terrain, the anticipated location of target emitters, and the enemy air defense threat dictate the distance behind the FLOT and altitude for each mission. Missions must be flown within range and LOS of target emitters. Also, aircraft must maintain LOS to each other. One aircraft must maintain LOS to the ground integrated processing facility.

(2) Quick Look.

(a) Capabilities. Quick Look is an ELINT collection and emitter location system. It provides commanders with identification, location, and deployment of noncommunications emitters. Quick Look classifies and locates electronic emitters. A ground-based data collection and emitter location facility receives this information by digital data link.

(b) Mission. Like Guardrail missions, Quick Look missions are flown in a standoff mode. Distance from the FLOT depends on the mission, terrain, and AD threat. Mission time is dependent on flight speed, altitude, and the distance from the airfield to the flight track.

(3) SLAR.

(a) Capabilities. SLAR is a moving target detector that can provide standoff surveillance of large areas. It can cover selected areas at various ranges on either side or both sides of the aircraft flight path. Information collected by SLAR is presented in near real time in the aircraft and transmitted at the same time to ground data terminals.

(b) Mission. SLAR has a near all-weather capability and is equally effective day or night. Its standoff capability places it out of range of Threat forward AD systems. However, standoff operations decrease the range of SLAR coverage beyond the FLOT.

b. Aviation Brigade (Corps and Division). Within the division and corps aviation brigades, SEMA assets provide the commander with rotary-wing IEW capabilities. SEMA assets of the aviation brigade are EH-1 and EH-60 (Quick Fix) helicopters. Quick Fix aircraft are organic to all US corps, divisions, and armored cavalry regiments.

(1) Capabilities. Quick Fix can provide airborne communications intercept, direction-finding, and electronic countermeasures. It is usually considered a deep-attack jamming system.

(2) Mission. Within the division, the MI battalion exercises operational control over the Quick Fix aircraft organic to the division aviation brigade. This system employs enhanced radio line of sight; this LOS provides the division G2 and G3 with an extended VHF-intercept and VHF-jamming capability that reaches beyond brigade areas of operations into the division's deep operations area. Quick Fix aircraft support the division's overall SIGINT collection and electronic battlefield templating to prepare for combat.

4-8. AIR TRAFFIC SERVICES

Air traffic service units offer a range of aviation combat support. ATS units provide services for US Army aviation, other US services, and allied forces. Commanders must integrate ATS employment into deep, close, and rear operations. ATS capabilities and coordination with A²C² functions are further described in Appendix H and FM 100-103.

4-9. WEATHER SUPPORT

a. Support Requirements. Weather is critical to Army tactical operations. Its effects must be considered by every tactical unit during all operational phases: deployment, employment, maneuver, CS, and CSS. Continually changing atmospheric conditions make meteorological data highly perishable. Thus weather observations and forecasts must be constantly monitored and updated so that they remain accurate and useful. Commanders must consider both favorable and unfavorable weather conditions to determine the best course of action for the mission. Aviation commanders and personnel, more than everyone else, are dependent on accurate weather data. Aviation can overcome the many drawbacks of terrain; however, weather influences the space in which aviation operates. Therefore, aviation requires direct weather support.

b. Weather Teams. The weather teams at all levels consist of a staff or an assistant staff weather officer and forecasters and observers. The teams provide 24-hour-a day weather services.

(1) Aviation brigade. Weather teams of the division and corps aviation brigade will be configured with seven and eight personnel, respectively. The WETMs will provide the aviation brigade TOC with weather support. Each team consists of an assistant staff weather officer, three enlisted forecasters, and three enlisted observers. Another officer will be added to the corps aviation brigade WETM to support the corps airfield. These personnel are to support corps aviation brigade operations and the facility that sustains fixed-wing assets of the corps command aviation battalion.

(2) Echelons above corps. EAC include those echelons within a theater. These echelons include joint, combined, and component commands. The Army component headquarters normally provides administrative and logistical support to USAF weather teams. However, an Army headquarters may be required for operational command between theater and corps. The size and organization of Army EAC vary with the theater. However, when employed, the headquarters requires weather support from the air weather service.

(a) An EAC weather team provides a staff weather officer on the commander's staff. It gives continuous (24 hours a day) forecasting support as well as continuous observation support at designated airfields.

(b) The EAC weather team serves as the center for weather support to a multicorps operation. Using centralized products from the AWS, the weather team prepares and tailors products (facsimile and teletypewriter) for the EAC commander and staff and subordinate commanders. Also, the team prepares finished weather products to support independent operations whenever these products are not immediately available from the AWS. These independent operations include those of the corps, division, separate brigade, and ACR.

(c) Subordinate to the EAC weather team are two Army airfield weather teams. These provide continuous observation and remote forecasting.

(3) Corps. The corps weather team operates in the CTOC area. It is supported by the corps HHC. The team serves as the Army force tactical forecast unit when no higher-echelon TFU is employed. It also provides direct weather support to the G2 and to the two corps airfields. The corps weather team gives guidance and assistance to the subordinate weather teams at division, separate brigade, and ACR. This support includes weather products that are tailored yet detailed enough to support division, separate brigade, and ACR operations. The team also functions as a hub for collecting and exchanging weather data and observations from subordinate weather teams within the corps area. The team operates weather-dedicated Army equipment including vehicles, generators, and communications equipment (except HF RATT equipment). It also maintains other CTA equipment such as tents and heaters. The team functions 24 hours a day and can observe weather and provide forecasting support to a tactical CP for limited periods. The corps weather team has an SWO and personnel who perform forecasting and observing. The aviation brigade weather team has an ASWO as well as forecasters and observers.

(4) Division. The division weather team coordinates with the DTOC. The team receives support from the division HHC. It provides direct weather support to the G2 at the division TOC and to the division aviation brigade. The division team collects weather data and observations. It exchanges them among subordinate brigade and battalion S2 assets, the corps weather team, or other higher-echelon forecasting agencies. Forecasts made by the division weather team are distributed to lower echelons by the G2 through the intelligence communications network. Like the corps weather team, the division weather team operates the weather-dedicated Army equipment. The team has a 24-hour-a-day capability to observe and forecast weather; it can support a tactical CP for a limited time. The division weather team contains an SWO as well as forecasters and observers. The aviation brigade weather team has an ASWO along with forecasters and observers.

(5) Armored cavalry regiment and separate brigade. The ACR is supported by the HHT and operates in the TOC area. Separate brigade weather teams are supported by the HHC and also operate in the TOC area. Each team provides continuous weather support to the ACR or separate brigade TOC. It can also provide limited direct forecasting support to subordinate units engaged in special operations. The team operates and maintains weather-dedicated Army equipment, except RATT. The ACR and separate brigade weather teams both have SWOs as well as forecasters and observers. FM 34-81 discusses weather support operations in detail.

c. Weather Effects. Weather is an important factor in planning aviation operations. Commanders need to analyze weather forecasts and consider weather effects before employing assets. Table 4-1 briefly describes how different weather conditions can affect aviation operations.

Table 4-1. Weather effects on aviation operations

WEATHER ELEMENT	RESULT
Altimeter setting (barometric pressure)	Is required for altitude accuracy.
Pressure profiles	Affect terrain avoidance.
Atmospheric electrification and electrical storms	Are hazardous to -- • In-flight operations. • Refueling operations. • Arming operations.
Cloud cover and ceiling	Limit operations requiring aircraft clear of clouds. May preclude landings or increase danger in takeoffs. May preclude tactical air missions.
Pressure altitude	Affects reciprocating engine performance.
Dew point	Affects engine efficiency calculations. Warns of possible fog formation or icing conditions.
Ice thickness	Affects selection of landing sites.
Icing	Affects aerodynamics of aircraft. Can preclude aviation operations.
Precipitation	Affects visibility and safety of flight. Affects density altitude.
Snow depth	Affects ground handling. May preclude hover operations (powdery snow).
Visibility	Affects landing and takeoff capabilities. Affects reconnaissance and target acquisition capabilities. Increases flight hazards (low visibility). Affects electro-optical target designation systems. Affects terminally guided munitions.

Table 4-1. Weather effects on aviation operations (continued)

WEATHER ELEMENT	RESULT
Surface winds	Affect aircraft control near the ground. Affect landing and takeoff. Affect ground speed for low-level flight.
Winds aloft	Affect navigation. Affect ground speed at higher flight altitudes.
Turbulence	Affects reconnaissance and surveillance shear effect systems performance. May cause aircraft structural damage. May affect aircraft control. Can preclude aviation operations (severe turbulence).
State-of-the-ground	Affects effectiveness of serially delivered munitions.
Refractive index	Affects radar, laser, and infrared range-finding techniques.
Temperature	Reduces lift capability of aircraft (high temperatures). Can increase maintenance requirements and increase time to perform maintenance (cold temperatures). Can reduce number of personnel carried because of weight and bulk of protection gear (cold temperatures).
Illumination	Affects night vision devices.

4-10. SIGNAL SUPPORT

a. Communication System. Commanders stress dispersion, mobility, and flexibility in employing tactical units. Unit commanders must have a continuous, flexible, and mobile communication system to support these operational concepts and to have the necessary C². The corps and division area communication system achieves these aims. Within the division, the signal battalion establishes and operates the division area communication system for the division command echelons to provide communications to subordinate units. Multichannel communications are established to each brigade headquarters. However, when MSE is fielded, communications support will be provided more on an area basis than on a habitual common-user basis. Within the division, communications also include tactical satellite, RATT, single-channel radios, and area messenger service. FM 11-50 explains division combat communications in detail.

b. Aviation Brigade Communications Capabilities. Communications within the division aviation brigade differ little from those within the corps aviation brigade. The aviation brigade depends heavily on single-channel voice radios because of the mobility of the units of the aviation brigade. Other types of communications used by the aviation brigade include multichannel systems, RATT, wire, messenger service, and heliborne command and control.

(1) Single-channel radio. FM and AM SSB voice radios are types of single-channel radios organic to the aviation brigade. The aviation brigade may also receive tactical satellite systems. Single-channel radios are the chief means of communication below brigade level. They supplement the division multichannel system at brigade and above. Aviation units also have airborne UHF and VHF radios in their aircraft for internal command and control.

(2) Multichannel. The aviation brigade does not have organic multichannel equipment. Multichannel support will come from the division signal battalion or from the signal brigade for the corps aviation brigade. The aviation brigade will interface with the division multichannel system the same as the other brigades. The brigade headquarters will receive one multichannel system from the forward communications company. Depending on the tactical situation and the commander's priorities, the aviation brigade may receive additional support. Multichannel expedites the bulk of the division's communications requirements at brigade and above.

(3) RATT. Radio teletypewriter support is organic to most battalion-size units and higher. The aviation brigade of the light infantry division must receive support from the signal battalion. The division maintains two RATT nets: the division operations and intelligence net and the division administrative and logistics net.

(4) Wire. Wire communications are used mainly for the unit's internal communications network. The division signal battalion does establish and maintain a wire (cable) system. This system connects the major supporting units (brigade and above and some separate battalions) to the signal centers' patching and switching central for added telephone capabilities.

(5) Messenger service. Messenger service is provided by the signal battalion down to the brigade and some separate battalion-level units. The aviation brigade may have to operate its own internal messenger service. The aviation brigade may also be tasked to support the division with aerial courier and messenger support.

(6) Heliborne command and control. In addition to ground signal support, the aviation brigade requires a heliborne C² capability. The command aviation company or assault helicopter company will provide this support to the brigade.

(7) Mobile subscriber equipment. When fielded, the mobile subscriber equipment system will be the backbone of corps and division communication systems. MSE is the common-user area communication system for all US Army corps and divisions. MSE integrates the functions of transmission, switching, control, COMSEC, and terminal equipment (voice and data) into one system. MSE provides the user with a telephone facsimile communication system extended by mobile radiotelephone and wire access. Users can communicate throughout the battlefield in either a mobile or a static situation. MSE can be described by five functional areas:

- Area coverage.
- Wire subscriber access.
- Mobile subscriber access.
- Subscriber terminals.
- System control.

(a) The MSE system covers the corps rear boundary forward to the division maneuver battalion rear area. The corps MSE system typically covers an area of 37,500 square kilometers (15,000 square miles). Node centers connect extension switches and radio access units. Extension switches allow wire line terminal subscribers (telephone, facsimile, and data) to enter the communication system. RAUs allow mobile radiotelephone users to communicate with other systems. The system control centers allow current information to be entered into the network management system. The MSE system is a nodal switched system extended by radiotelephone. Figure 4-4 shows the MSE network as integrated within the corps and division force structures.

(b) The MSE architecture supports area common-user communications requirements on a dynamic and integrated battlefield at corps and division. Requirements include network survivability under damage and overload conditions and self-adjusting routing during both rapidly changing load patterns and locations of subscribers (Figure 4-5).

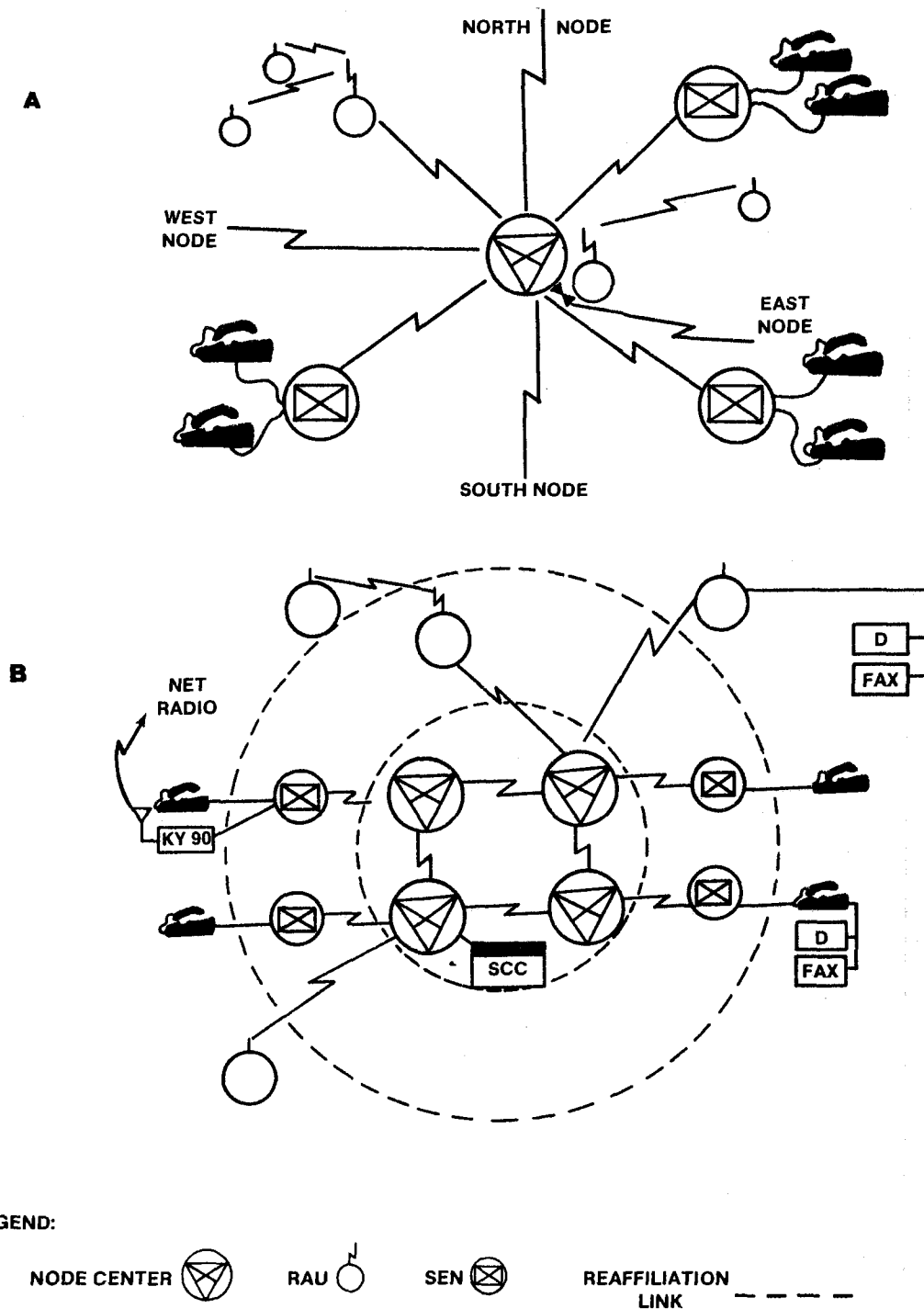


Figure 4-4. MSE network as integrated within the corps and division force structures

37 OF 42 NODES DEPLOYED

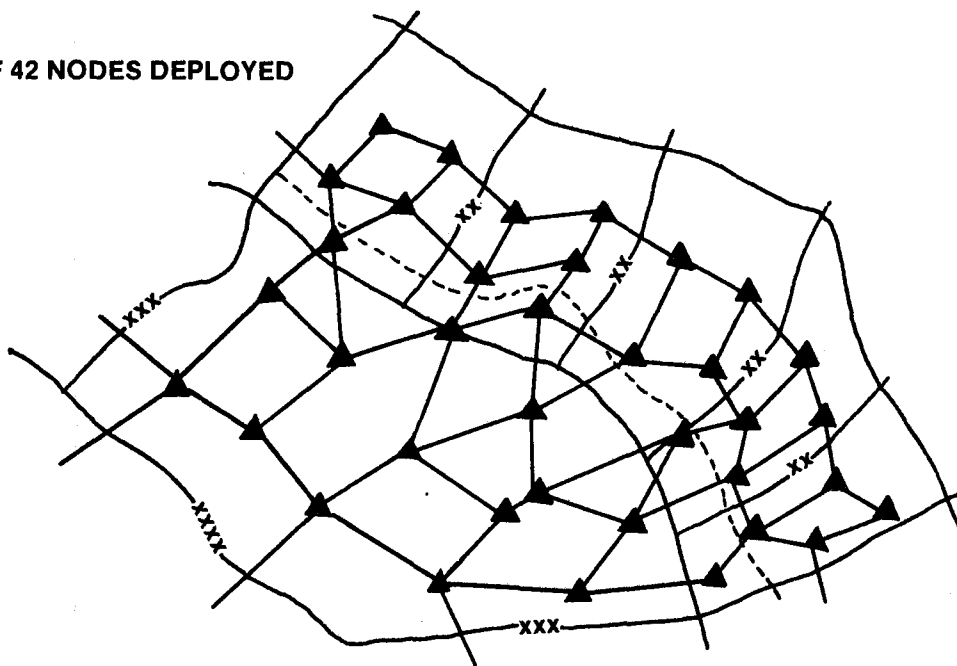


Figure 4-5. MSE architecture in support of the corps or the division

(c) MSE has two major roles. First, it furnishes CP communications from brigade back to the corps rear area. Second, it furnishes mobile radiotelephone service for high-priority users forward into the maneuver area. MSE enhances CP movement; it provides continuous telephone service to users with mobile subscriber radiotelephones during movement. CP setup and teardown times are greatly reduced because wire and cable requirements are reduced. The RAU provides a communications link through other NCs when CPs relocate. The currently fielded communication system without MSE technology cannot respond to the fluid battlefield in today's Threat environment; however, MSE will provide continuous and in-depth communications, particularly during force and CP movement (Figure 4-6).

(d) Figure 4-7 shows a typical MSE system deployed in a division. FM 11-999E describes the system in more detail.

(e) Eventually, the MSE is envisioned as the primary communications means for C² support systems such as the maneuver control system. The MCS will provide automated support to maneuver commanders from corps through battalion. The purpose of MCS is to enhance and shorten the information acquisition portion of the decision-making cycle. Also, the MCS will improve the means of directing and synchronizing subordinate and supporting units and aid in selecting courses of action.

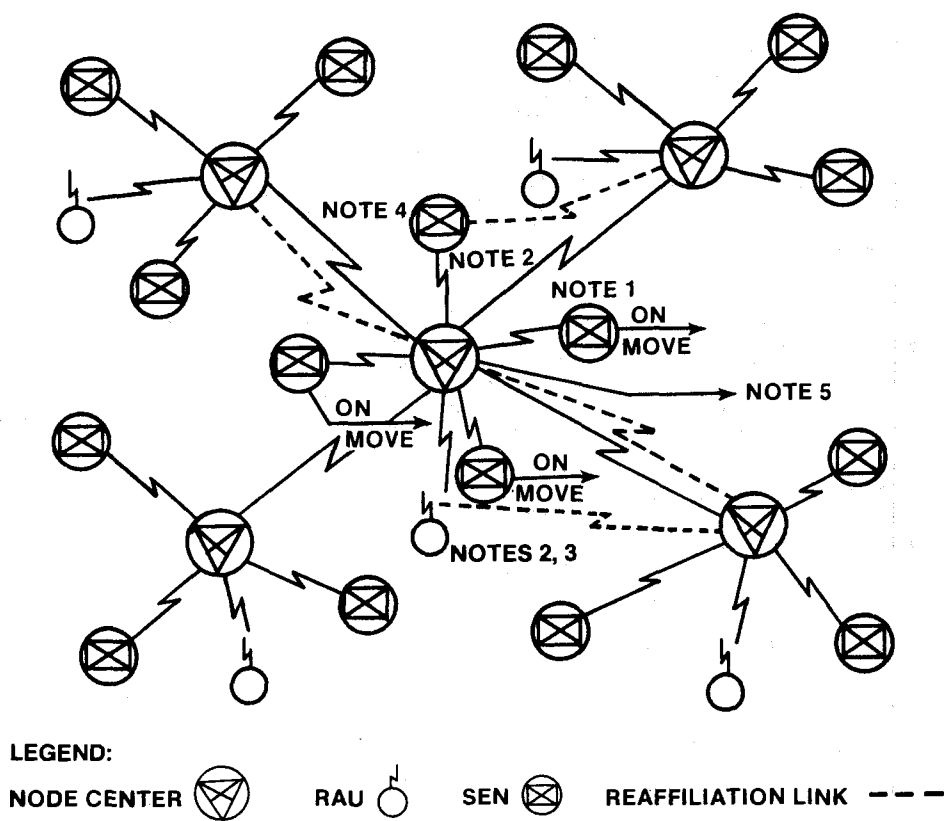


Figure 4-6. Communications provided by MSE during force and CP movement

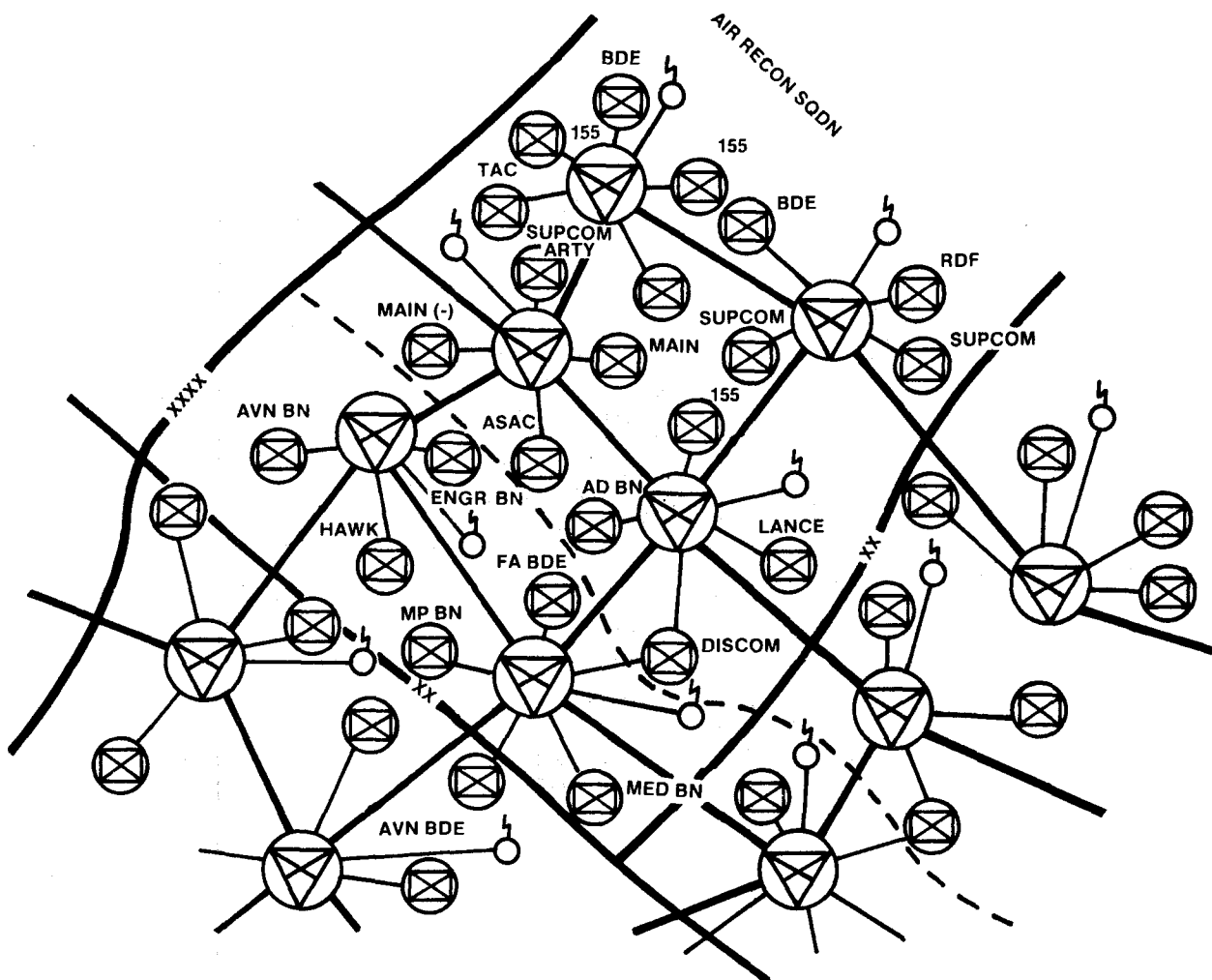


Figure 4-7. Typical MSE system deployed at division

4-11. MILITARY POLICE SUPPORT

a. Operations. Military police perform MP missions critical to the success of the tactical commander's intent and concept of operation. MP expedite movement of combat resources on MSRs leading into rear areas and patrol their area of operations to protect critical locations and facilities. They also evacuate enemy prisoners of war from forward areas and conduct law-and-order operations when directed to do so. FM 19-1 discusses MP operations in more detail.

b. Battlefield Missions. Military police have four battlefield missions: battlefield circulation control, area security, EPW operations, and law-and-order operations. Each mission is composed of a number of

operations. The operations can be done independently or combined to accomplish the missions. The specific operations MP units perform at a given time are determined by the tactical commander's need and the availability of MP resources. Because MP resources are limited, all assets are committed at all times.

(1) Battlefield circulation control. Battlefield circulation control, a main MP mission, helps move military traffic along the MSRs smoothly, quickly, and with little interference. For BCC, MP reroute traffic to meet changes in tactical situations, enforce MSR regulations, and reconnoiter primary and alternate MSRs. MP control refugees and stragglers. As MP perform these missions, they collect and report information on the friendly and enemy situations. They monitor road and traffic conditions; they also report on the status of key terrain influencing the military road network. All of these MP actions help the maneuver commander move his people and supplies where and when he needs them.

(2) Area security. MP protect designated facilities, units, convoys, MSR critical points, and people from enemy activity in the rear area. They also conduct area reconnaissance to gather and document information about enemy activity in the rear area.

(a) MP conduct rear operations to identify, intercept, and destroy small enemy forces before they can close on their objective. MP protect against Level II threat attacks on bases and units that cannot defeat the enemy without assistance as described in paragraphs 3-17, 3-21, 3-25, and 3-35. MP also respond to Level III threat forces. MP determine the size and intent of Level III threat forces, delay and disrupt their progress, and help friendly combat forces defeat them.

(b) MP perform area damage control operations to reduce the damage caused by enemy activity or natural disaster. MP also continuously detect and report NBC contamination.

(3) Enemy prisoners of war. Military police EPW operations control the flow of EPWs from their capture to their internment in prisoner-of-war camps. MP in a division MP company operate division forward EPW collecting points in each brigade. They evacuate EPWs captured in the MBA from the division forward EPW collecting points. They also operate the division central EPW collecting point. MP company members from the corps evacuate EPWs from division central EPW collecting points and operate the corps EPW holding area.

(4) Law and order. MP law-and-order operations, if needed, provide police services on the battlefield. These services include investigating criminal offenses, performing law enforcement operations, and confining US military prisoners. FM 19-1 describes MP support in more detail.

4-12. CHEMICAL SUPPORT

Chemical units reduce the effects of enemy NBC weapons on combat operations. These units focus on smoke, NBC reconnaissance, and decontamination operations. The brigade chemical officer advises the commander on NBC defense procedures, the employment of smoke and flame, reconnaissance, and decontamination assets. As described in Chapter 2, chemical units can provide NBC reconnaissance; equipment decontamination; and smoke support to the brigade. Chemical units--

- Operate hasty and deliberate decontamination sites for combat operations.
- Provide hasty smoke to supported units.
- Conduct simultaneous decontamination and smoke operations.
- Provide NBC reconnaissance support.

COMBAT SERVICE SUPPORT

This chapter implements portions of STANAG 2999 (Edition One) and QSTAG 586.

Aviation operations require a great deal of sustained logistics support from and to aviation forces. Rotary-wing and fixed-wing assets use vast quantities of CSS, particularly aviation fuels and ammunition. CSS elements for aviation brigades include supply, maintenance, transportation, and personnel and field services. This chapter gives an overview of the CSS system. It explains how aviation brigades coordinate with these elements of the CSS system.

5-1. CSS PLANNING

The planning required to provide CSS depends on METT-T and the intensity of the conflict. For example, for a low-intensity conflict, staff officers need time to task-organize the CSS base. They also need time to coordinate the use of storage facilities, the transport of personnel and equipment, and the development of a workable logistics system. As a rule, CSS and logistics requirements become increasingly standardized as the intensity of the conflict increases. As support requirements become standardized, less time is needed for planning. However, each mission still requires time for planning support. Figure 5-1 depicts the relationship between time and the conflict intensity. Threat doctrine recognizes the importance of logistics support to aviation. Threat forces employ units to locate aviation support organizations. They know that destroying these organizations will render aviation assets combat-ineffective. Threat forces also recognize that many friendly operations depend on aviation employment against Threat armor, air defenses, and logistics support bases.

a. Planning CSS Organization. Aviation brigade units normally employ their CSS assets in echelons (Figure 5-2). Careful planning is required to ensure the success of this concept. CSS must adequately support forward-deployed aviation units. FARPs are considered the combat trains of most units. Division, corps, and theater aviation place their CSS to achieve the best support of their units. Normally, logistical assets are task-organized to support the mission. Command and staff sections position themselves where they can best execute the logistics plan. Each train or support location contains only the minimum number of personnel required to provide support, supervise personnel, and provide security. Because of the complex and unique nature of aviation support, SOPs and the logistics annex are essential. SOPs should be continuously updated to clarify procedures for routine--

- Resupply.
- Maintenance.

- Transportation.
- Field services.
- Health services.
- Personnel services.

Paragraph 4 and the logistics annex of the OPORD also address the support requirements and responsibilities of supported units. The use of SOPs and OPORDs identifies the capabilities of supporting units to supported units.

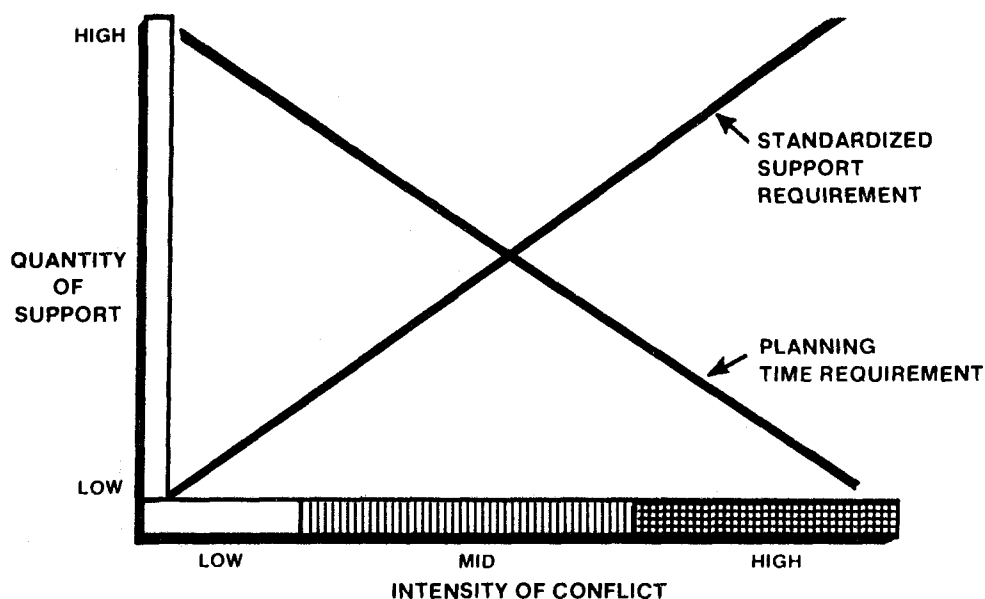


Figure 5-1. Relationship of time to conflict intensity

b. Planning Responsibilities. C² of CSS units requires at least an understanding of the CSS commander's responsibilities; familiarity with the responsibilities and capabilities of the higher, subordinate, and adjacent elements; and close contact and information exchange among these elements.

(1) CSS planning is a command responsibility. The commander weighs CSS considerations in deciding courses of action. He also ensures that the operational planners are informed of logistical capabilities and that the logistics planners are kept informed of current and future plans. The commander directs that equipment issued to units or organizations be in serviceable and combat-ready condition. He further enforces proper equipment use, accountability, and maintenance. The commander must also consider personnel readiness, replacement availability, and personnel loss estimates.

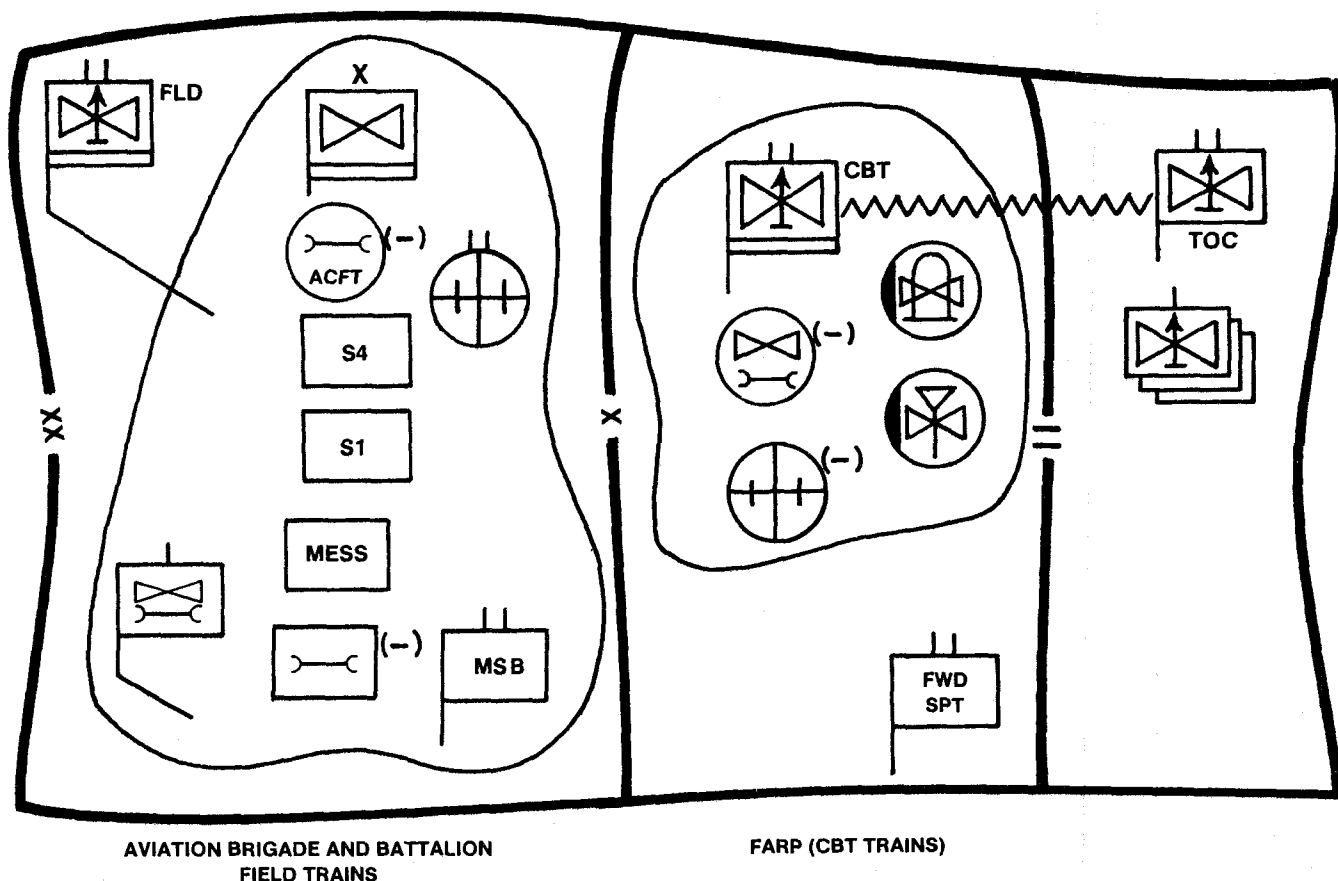


Figure 5-2. Example of a deployed attack helicopter battalion and its CSS assets

(2) The executive officer is responsible for administrative and logistical planning. He supervises the logistics support. He also ensures that subordinate units prepare and forward administrative and logistical status reports. The executive officer integrates all staff sections so that staff members understand their responsibilities. He keeps the commander informed on materiel readiness.

(3) The commander, S3, and S4 must understand the capabilities of their supporting units. Many commanders develop alternate plans that allow for mission completion without overextending their supporting units. These plans reduce planning time because corrective actions, such as augmentation or task organization, are identified in the OPLAN before it is executed. The S4 and executive officer have one of the most demanding tasks of the organization. They plan for each operation and ensure adequate support is at the proper place at the proper time. Much of the logistics support must be coordinated before it is included in the OPLAN. The commander and his staff follow up often on the status of CSS assets so that support is provided as planned. CSS planners must anticipate requirements and integrate them into the OPLAN. They must plan for a responsive system that can provide continuous support; they must improvise when necessary.

c. Planning Principles. CSS planners embody the precepts of continuity, anticipation, integration, responsiveness, and improvisation. There is no time to react to decisions and circumstances. Support is provided when, where, and in the quantities required. CSS planners are flexible enough to rapidly respond to the commander's needs, not just to his orders. They must understand the commander's intent, as well as his orders, and must act to support his intent.

(1) CSS planning consists of the continuing and essential functions that support the mission and provide responsive logistics support to the supported force. CSS commanders and planners must know and understand the tactical mission and plans. After analyzing the tactical concept of operations, CSS commanders and planners can predict support requirements. CSS planners must sustain the operation so that the commander can achieve the tenets of AirLand Battle doctrine. They determine the type and quantity of support required and the priority of support by type and by unit.

(2) CSS planning is neither static nor finite; it has to accommodate the requirements of the supported force during all phases of the operation. The availability of critical supplies and munitions may decisively influence combat operations. Therefore, CSS planners must act on, rather than react to, support requirements.

d. Deception Planning. CSS assets and supplies are also required to support deception operations. Pre-positioning CSS assets at false locations is an excellent deceptive tactic. To aid the deception, personnel can use false containers and equipment to hide the real equipment. Deception operations are difficult to plan and execute. However, they enhance the element of surprise and further exploit the capabilities of aviation. Deception operations must be rehearsed and executed often according to the higher commander's intent. Support can be provided in more than one way. Innovative thinking and frequent training exercises may reveal other alternatives. CSS requires flexibility and responsiveness. The S4 must grasp the complex support requirements of aviation. He provides the support that enables the commander to integrate his assets into the scheme of maneuver.

e. Tactical Planning. The tactical plan and CSS plan are developed concurrently. Thus tactical and CSS planners can establish communications links with each other. Normally, the tactical plan or concept of operation is not finalized until CSS planners have determined the supportability of proposed courses of action and have been allowed to provide alternatives. When the supported force concept has been determined, the CSS planning requirements are projected and plans are developed to satisfy those requirements.

f. Planning Analysis. When planning the support of operations, CSS planners are continuously involved in risk analysis of various options. They always have to balance the benefits of a support concept against the risks involved in the support provided; for example, deciding the location of the support areas. For each operation, commanders and CSS planners assess the situation, measure the risk, and select the best course of action. Thus they recognize that every possible action has a degree of risk. After a course of

action has been selected and the risk analysis is completed, detailed planning occurs before the operation is executed. The planning includes determining--

- What support is required.
- Where the support is needed.
- What quantity of support is required.
- Who provides the support.

Detailed SOPs aid this process by allowing management by exception. The planning becomes easier as the unit builds historical data on supply expenditures and requirements. Contingency plans are also formulated to handle expected future courses of action. These plans further lessen the time required to react to changing battlefield support requirements.

5-2. CSS ORGANIZATION

On the battlefield, the organizations that will provide CSS are varied and become more complex with each higher command level. CSS forces at corps and higher level are organized using a building block concept. The support force is tailored in size and variety to meet the needs of the force that it supports. At the division, the CSS force is structured based on standard TOEs for similar units. Below is a synopsis of various CSS organizations at different command levels within a theater.

a. Theater Army. The theater army (Figure 5-3) is a large organization with several operational, functional, and area commands. The size of the TA is tailored to mission demands; it varies from one theater to the next. The theater provides CSS to Army forces and other designated forces in the theater of operations.

(1) The theater is divided into a combat zone and a communications zone. Normally, the operational commands, such as the corps, are found in the CZ. That area from the rear boundary of the corps to the rear boundary of the theater is the COMMZ. Functional and area commands are normally located in the COMMZ.

(2) The theater army's major subordinate commands concerned mainly with providing CSS are the--

- Personnel command.
- Finance command.
- Medical command.
- Engineer command.

- Transportation command.
- Theater army area command.

Theater-level coordination of maintenance, supply, and transportation activities is provided by functional control centers. These centers are the materiel management center and the movement control agency.

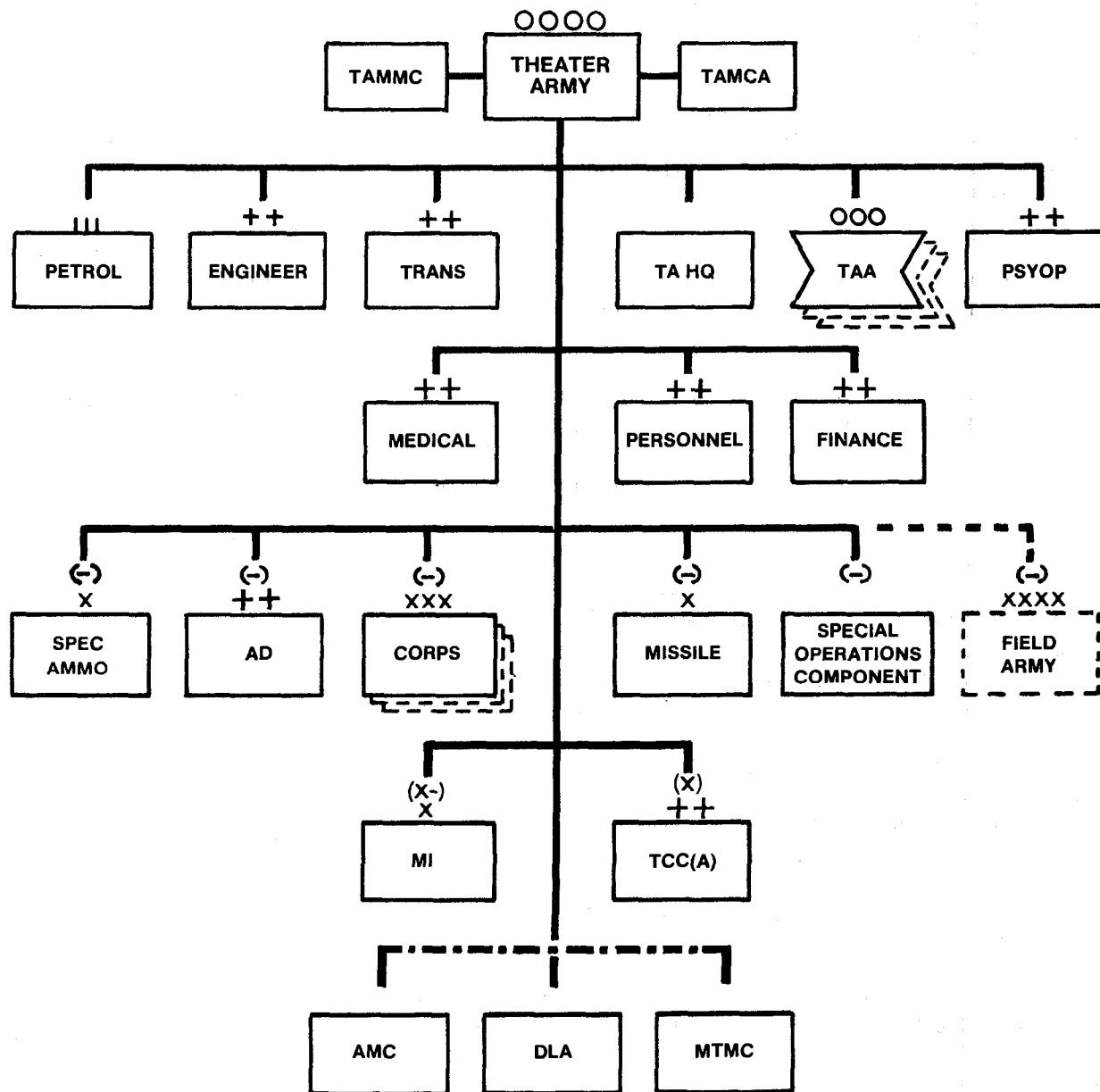
(a) Personnel command. The personnel command is a functional command. It is responsible for all personnel activities. There are three key military personnel leaders at the theater. The DCSPER is the theater's personnel manager; the AG directs command-related military personnel functions. The PERSCOM commander directs general military personnel functions.

(b) Finance command. The finance command is composed of a theater finance support center and subordinate area finance support centers. They provide a full range of finance and accounting services to units in the COMMZ. The TFSC also provides theaterwide finance and accounting services such as funding to provide currency to finance elements located away from military banking facilities.

(c) Medical command. The medical command is a functional command. It provides medical support to all US Army units and to designated units of other services located in the COMMZ. It also provides medical support to the CZ by relieving it of patients and by reinforcing its medical services. The medical command provides both direct and general medical support--services, supply, and maintenance--to US Army units located in the COMMZ.

(d) Engineer command. The engineer command is a functional command. It is responsible for combat and construction support to the corps and theater army and to other designated forces in the theater. It also provides topographic and real property management support for those forces in the TA and corps and other designated forces in the theater.

(e) Transportation command. The transportation command is a functional command. It is responsible for the C² of transportation assets assigned or attached to the theater army operating in the COMMZ. It also provides transportation support in areas of mode operations. These areas include inland waterways, rail, motor, and air; terminal services, to include water, beach, air, motor transport, and rail; and movement management, to include transportation movements and highway regulation. The transportation command also manages the portion of intratheater transport systems allocated to the TA. These systems include the USAF air transport, Military Sealift Command, and US Navy water transport.



LEGEND

————— COMMAND
 —(-)— COMMAND LESS OPCON
 —(X)— OPERATIONAL CONTROL

—(X-)— OPCON LESS SPEC FUNC
 - - - - - RELATIONSHIP ESTABLISHED BY MOA
 - - - - - MULTIPLE OR OPTIONAL UNITS

Figure 5-3. Typical theater army organization

(f) Theater army area command. The TAACOM, an area command, provides personnel, administrative, and logistics support to units located in or passing through the COMMZ to the CZ and to other forces as directed by the TA commander. Also, units of the theater army support group (GS) provide general support supply and maintenance support for the TA.

b. Corps Support Command.

(1) A COSCOM normally supports from two to five divisions. To support this varied number of forces, the corps support forces are tailored. The number and types of CS and CSS units will vary with the number and types of divisions attached to the corps. Thus CSS units are organized on the building block concept; existing companies are formed into units (battalions and groups) to assemble support. The COSCOM provides GS to divisions and DS and GS to nondivisional units within the corps. Figure 5-4 shows a typical COSCOM organization consisting of the units listed below.

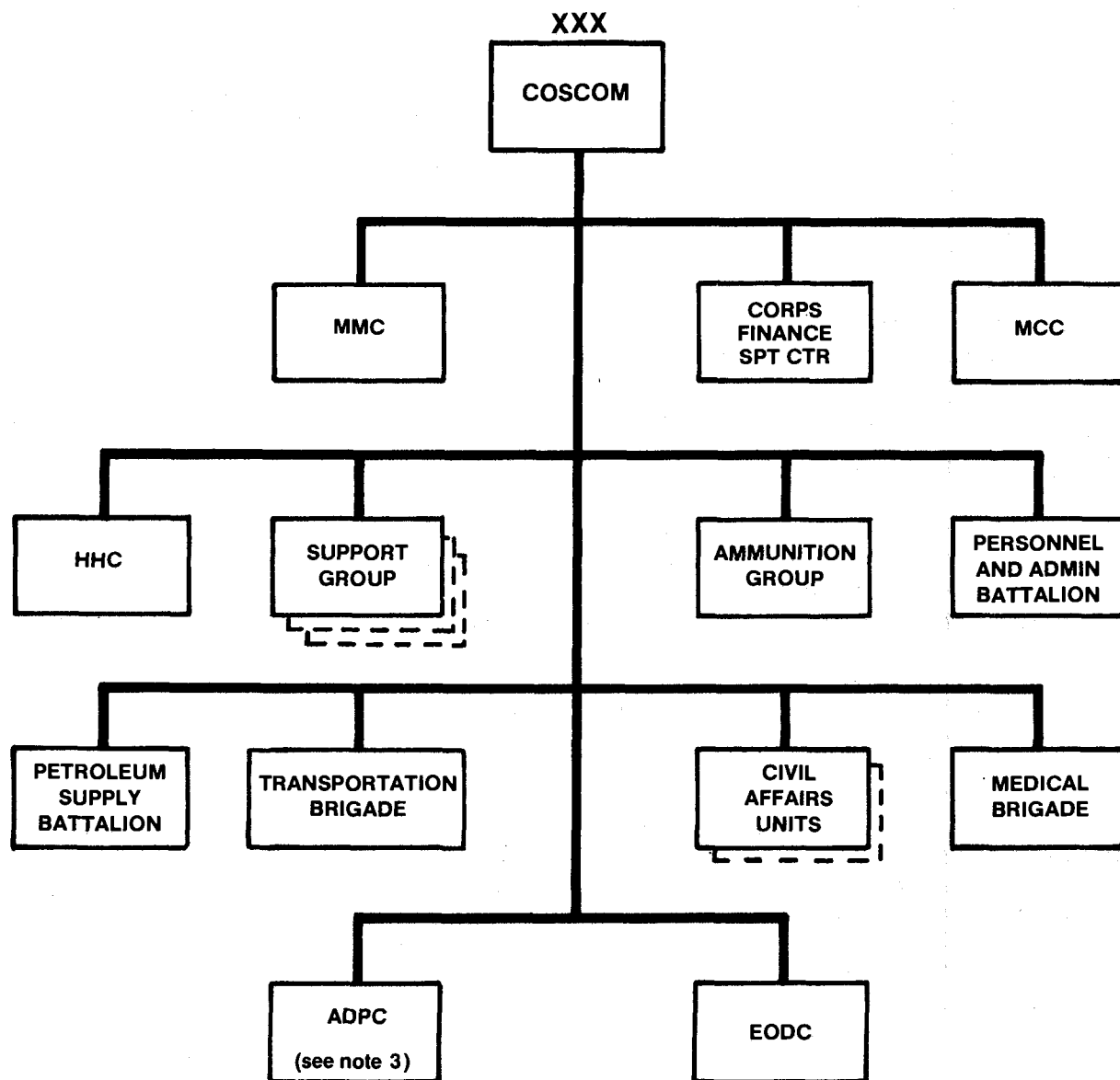
(a) MMC and MCC. There are two major functional control centers within the COSCOM--the MMC and MCC. The COSCOM MMC integrates supply and maintenance management of all GS-level supplies and maintenance within the corps. The MCC provides routine management for all transport or movement within the corps. The MCC maintains the road network and traffic circulation plan. It also allocates transportation assets throughout the corps.

(b) Personnel services unit. This unit is a personnel group. The personnel group provides personnel support to assigned or attached tactical personnel units. It also task-organizes and deploys assigned personnel units to meet the situation. The personnel group provides liaison with divisions, corps, and the personnel command to fulfill all support requirements.

(c) Medical units. These units are assigned to a medical brigade or group. This brigade or group contains hospital units; ambulance units, both ground and air; and medical supply units.

(d) Transportation units. Normally, this is a transportation brigade or group. It works closely with the MCC to control transportation assets throughout the corps.

(e) Supply and maintenance units (less Classes III and V). Normally, supply and service battalions and maintenance battalions are organized under a support group. A typical COSCOM has two forward support groups. These provide DS and GS and maintenance support to divisional and nondivisional units. The COSCOM also has one rear support group that provides DS and GS to the corps. The support group itself is a flexible organization; its size varies according to the size of the force it is supporting.



NOTES:

1. The command structure of the subordinate units is not rigid; that is, groups will become brigades or brigades will be replaced by groups, depending on the magnitude of the mission requirements.
2. Company, battalion, or group-size organizations are assigned to the subordinate commands to tailor the support capability to meet the corps force requirements.
3. The application of automation to support CSS operations is changing from large data processing centers servicing several organizational elements to the assignment of dedicated ADPE to the using organization requiring the automation. Once this transition has occurred, the ADPC will be eliminated from the COSCOM structure.
4. The corps finance support center may be under COSCOM or corps control.

Figure 5-4. Typical COSCOM organization

(f) Ammunition units. Normally, an ammunition group is assigned to each COSCOM. The group provides technical direction and C² for both GS and DS companies. This group operates the corps storage areas and ASPs and also supports the ammunition transfer points in the divisions. They are normally augmented with TA assets for handling special ammunition.

(g) Petroleum units. Normally, these units are petroleum battalions. These units have their own Class III bulk-hauling capability. They support divisional and nondivisional units with bulk Class III line-haul. They also provide the corps with Class III bulk storage and distribution. When augmented, these units can perform terminal transfer and pipeline or rail operations.

(h) Civil affairs units. Normally, a civil affairs company is assigned to each COSCOM. It manages refugee control and helps coordinate host nation support.

(i) Explosive ordnance disposal units. Normally, an EOD control team is assigned to the COSCOM. This team has subordinate EOD detachments; these detachments provide EOD service throughout the corps area to reduce hazards from unexploded ordnance.

(j) Finance units. Corps finance units are part of a finance group. The commander has staff responsibility, as well as technical supervisory responsibilities, for all pay functions in the corps. The commander also has C² for FSUs assigned or attached to the corps.

(k) NBC reconnaissance and decontamination units. Chemical units conduct decontamination. They may assist in unit sustainment decontamination operations. These units provide radiological monitoring. They clear and decontaminate critical areas to the extent possible. If possible, they also clear and decontaminate supplies and equipment before removing them from the battlefield.

(l) Graves registration units. The GRREG units provide C² for from two to five companies. They establish collection points and process remains. The GRREG units establish, operate, and maintain military cemeteries. They also conduct area search and recovery operations.

(2) Specific corps support group missions are listed in the COSCOM OPORD. The TOE for the CSG HHC is the same for forward and rear CSGs; however, basic missions of the CSG depend on whether it is employed in the forward or rear portion of the corps rear area. Subordinate CSG units supply weapons and ammunition to sustain the aviation brigade.

(a) Forward-employed CSGs. Forward-employed CSGs provide--

- Support to nondivisional corps forces operating in a committed division's area of operations. Instead of returning to supporting units in the corps rear, the aviation brigade would be supported by logistics units or teams assigned or attached to forward CSGs and employed in the DSA.

- Area support to units behind the division's rear boundary. Support requirements vary as units move into and out of the CSG's area. Thus the correct range and quantity of ASL stocks are difficult to determine. Therefore, the COSCOM MMC requires intensive stock management.
- Backup support to the committed division. The amount of support depends on the type of division; the greatest amount normally is required for light infantry divisions.
- Support for a deep attack. Support requirements depend on the depth and length of the attack and whether ground LOCs are secure.

(b) Rear CSG. The rear CSG provides--

- Area support to units employed in or passing through its area of operations, to include divisions in reserve, separate brigades, and ACRs.
- Backup support to forward CSGs.
- Corpwide GS supply; for example, bulk Class III(A) fuel is normally transported by throughput distribution to the division aviation brigade.
- Resources for reconstitution of degraded units.

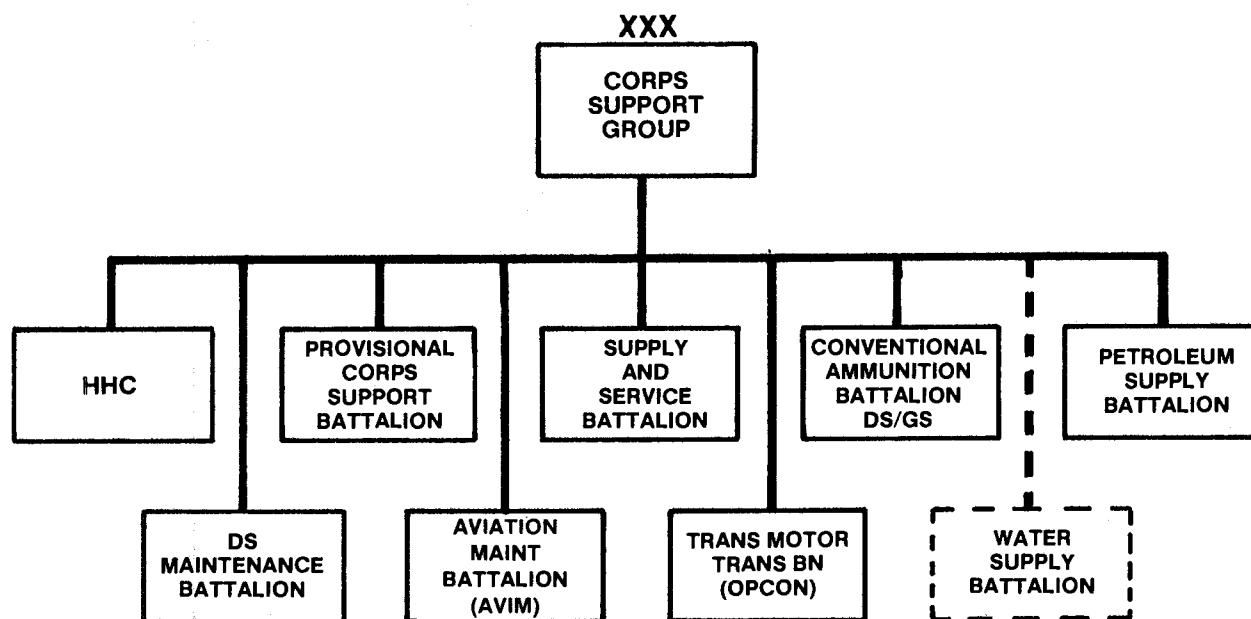
(c) CSG allocation. The number of CSGs employed by the COSCOM depends on the--

- Number and type of divisions committed.
- Number and type of corps nondivisional units supported.
- Number of subordinate battalions requiring C².
- Extent of host nation support available.
- Corps assets required to support a contingency or a deep attack.
- Factors of METT-T.

Normally, one CSG is allocated per committed division sector. Each CSG supports units operating in the forward portion of the corps rear area. Another CSG is allocated per COSCOM. This rear CSG provides area support to units in or passing through the rear portion of the corps rear area. For a five-division corps with three divisions abreast, this equates to four CSGs per mature corps. If there are more than three organic divisions, a CSG supports more than one division. Depending on the intensity of battle and the number of subordinate battalions, a CSG with six or seven subordinate battalions may support two divisions.

(d) Area of responsibility. The COSCOM commander assigns forward-oriented CSGs an area of responsibility along the corps frontage behind the committed division rear boundary. He adjusts those areas of responsibility based on the density of supported units, intensity of combat, and forward or rear movement of division boundaries. The COSCOM commander also assigns an area support sector to the rear CSG. That sector may encompass an area from the rear of forward CSGs to the rear boundary of the corps.

(e) Task organization. There is no standard CSG organizational structure. CSGs can provide command, control, staff planning, and supervision for from three to seven of the subordinate battalions shown in Figure 5-5. The number, type, and mix of subordinate elements vary based on force modernization and the tactical support situation. The COSCOM ACoS for security, plans, and operations will task-organize CSGs based on support mission requirements. In low-intensity conflicts, units normally employed in the COMMZ may be assigned or attached to a CSG. As the number and type of supported units change, CSGs change the way in which their subordinate battalions are organized to provide support. Thus a CSG employed forward in support of nondivisional corps units operating in a heavy division area of operations differs from a CSG employed forward in support of a committed air assault division. CSGs task-organize subordinate battalions by assigning or attaching logistics units to provide the required support. When the supported division is relieved, the CSGs task-organize their assigned or attached logistics units to better meet the requirements of the incoming division.



NOTE: The number, type, and mix of subordinate battalions will vary. The COSCOM will task-organize the support groups based on the support mission.

Figure 5-5. CSG organization

(f) Aviation maintenance battalion (AVIM). An aviation maintenance battalion (AVIM) is normally assigned to each COSCOM. The COSCOM may assign the aviation maintenance battalion (AVIM) to the rear CSG for employment near a fixed facility. AVIM units are further described in this chapter and FM 1-500.

c. Division Support Command.

(1) The DISCOM (Figure 5-6) is the major service support organization that provides division-level CSS to all organic and attached elements of the division. The DISCOM is a brigade-size element in which the divisional CSS units are organized. The DISCOM is standardized to a degree for the armored and mechanized infantry divisions. It is organized to provide planning, direction, and supervision of CSS (except COMSEC, logistics, construction, legal services, and public affairs) for the division.

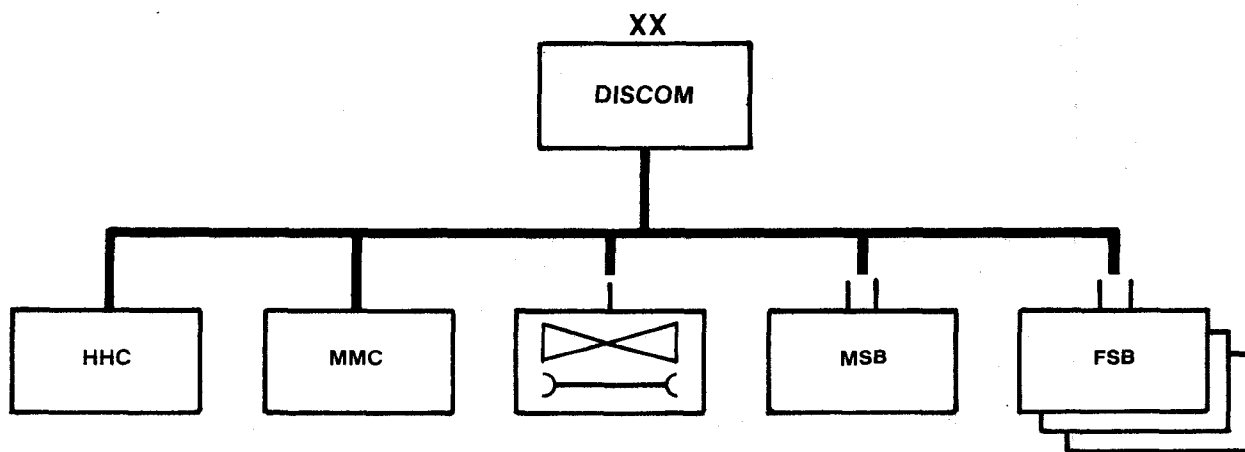


Figure 5-6. Typical DISCOM

(2) The DISCOM has six major functions. They are--

- Supply.
- Maintenance.
- Transportation.
- Health services.
- Personnel services.
- Field services.

(3) The DISCOM provides logistics support through three methods--unit, area, and task support. Unit support is furnished to a designated unit or group of units. Command relationships for these units normally include OPCON, DS, and GS. Area support is furnished to all units within a designated geographic area. Task support is a type or an amount of a unit's support that is furnished to designated units or an area so that the unit can accomplish identified tasks.

(4) Maintenance, supply, transportation, and medical assets are organized to form three forward support battalions and one main support battalion. The HHC and the DMMC are combined into one element. The AMC is organic to the DISCOM; it provides AVIM support to the divisional aviation units.

(5) The FSB has an HHC and a coordinating and technical staff, a supply company, a maintenance company, and a medical company (Figure 5-7). The FSB is organized to support a brigade-size force. With augmentation, each FSB can support other divisional units operating in the area such as signal, cavalry or air reconnaissance, MI, and aviation brigade elements. Currently the same concept is employed within the air assault and airborne divisions except that tailored support assets are referred to as forward service support elements. Forward area support coordinators serve the same function in an FSSE as the HHC of an FSB.

(a) Supply company. The supply company operates an ATP where ammunition for all divisional units operating in the area is transferred from corps or division transportation assets to unit resupply vehicles or aircraft. Also, this company establishes and manages a Class I ration breakdown point; a Class II, IV, and VII issue point; and a forward Class III distribution point.

(b) Maintenance company. The maintenance company provides DS maintenance and backup unit maintenance support such as evacuation. Also, it may be augmented with maintenance support teams from the corps or divisional MSB assets. These teams are weapon-system specific; they are assigned based on the type and mix of battalions assigned to the brigade.

(c) Medical company. The forward medical company consists of a company headquarters, an ambulance platoon, and a trauma treatment platoon with a 40-patient holding capability. The company provides both unit (Level I) and divisional (Level II) health service support. This company also has a limited capability for resupply of Class VIII items.

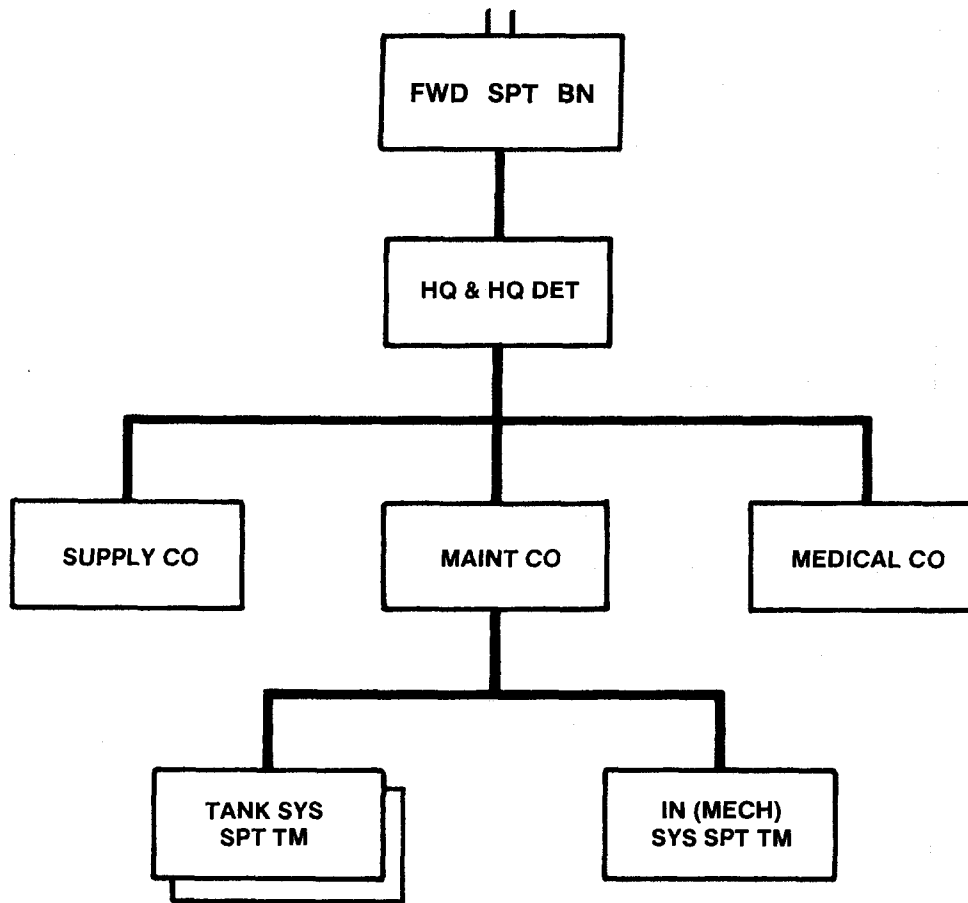


Figure 5-7. Forward support battalion, DISCOM

(6) The main support battalion is organized as depicted in Figure 5-8.

(a) Headquarters and headquarters detachment. The headquarters and headquarters detachment includes a coordinating and technical staff.

(b) Supply and service company. The supply and service company provides receipt, temporary storage, and issue of Class I, II, IV, and VII supplies except aircraft, maps, airdrop, and rail supplies. It can store and issue 299,000 gallons of bulk POL per day (to include a one-day supply of JP4). It can also operate an ATP where ammunition can be transshipped daily from corps vehicles to the using unit transportation. The company provides such field services as GRREG and salvage collection to the supported brigades and separate battalions or companies. The company also maintains the divisional reserve of Classes I, II, IV, and VII.

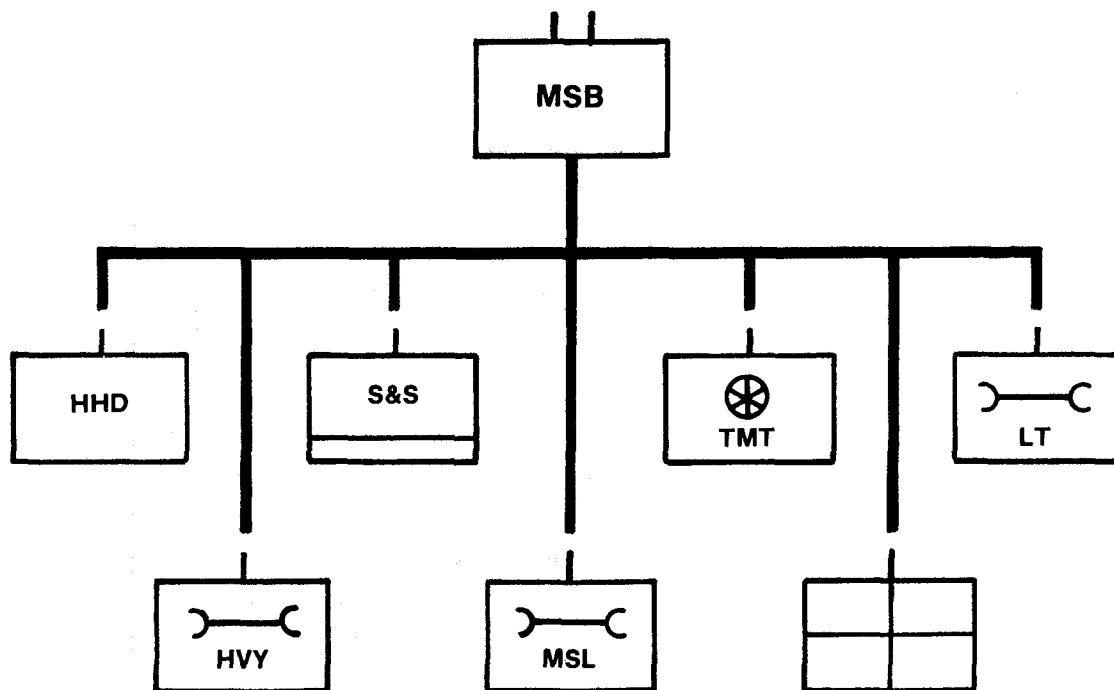


Figure 5-8. Main support battalion, DISCOM

(c) Transportation motor transport company. The transportation motor transport company provides truck transportation for unit distribution of Class I, II, III (packaged), IV, and VII supplies. It transports the division reserve. It also furnishes vehicles to assist divisional elements with a requirement for supplemental transportation, to include emergency unit distribution of Class V supplies. The company provides heavy equipment transportation for movement or evacuation operations.

(d) Light maintenance company. The light maintenance company plans and directs DS maintenance operations of divisional equipment for which the MSB is responsible. It maintains the divisional Class IX ASL. It also operates the repairable exchange service for selected repair parts and maintains the divisional operational readiness floats.

(e) Heavy maintenance company. The heavy maintenance company provides DS maintenance support for--

- Automotive equipment.
- Artillery equipment.
- Tank turrets.

- Fire control systems.
- Engineer equipment.
- Small arms.

It provides on-site and combat system-oriented maintenance support through maintenance support teams.

(f) Missile support company. The missile support company provides DS maintenance support for--

- Dragon.
- Vulcan.
- Chaparral.
- Ground TOW.
- Forward area alerting radar systems.
- Portable common thermal night sights.

The company stocks Class IX repair parts for these systems. It also repairs and exchanges selected items for these missile systems. This company does not maintain aircraft missile or armament subsystems. Missile maintenance support for aircraft is provided by the armament platoon at the AMC.

(g) Medical company. The medical company operates the division clearing station. It provides unit (Level I) and divisional (Level II) health service support to units in the DSA. It consists of a company headquarters, an ambulance platoon, and a treatment platoon. The company has a 40-patient holding capability. It also has an optical section, a mental health section, and a preventive medicine section.

(7) The MSB provides area CSS coverage to the aviation brigade. The aviation brigade may also coordinate with the DISCOM for area support from the FSB when aviation brigade units are in the forward area. When the aviation brigade is task-organized with other combat and combat support units and is functioning as a task force headquarters, the DISCOM may organize the required CSS assets to form a service support element in DS of the aviation brigade.

(8) Support from the DISCOM is coordinated between the aviation brigade and the support operations section of the DISCOM headquarters. Constant communication is maintained with this section so that the aviation brigade's needs are communicated quickly. Much of the support is provided on an area basis. The aviation brigade S4 continuously updates the DISCOM on the status of fuel and ammunition; the DISCOM alerts the appropriate support

system. SOPs are established between the aviation brigade and the DISCOM; these SOPs speed resupply of critical items and cover the CSS for the aviation brigade when communications are lost.

(9) Within one mechanized infantry division is a fourth FSB that directly supports the aviation brigade. It increases combat capabilities and allows the aviation brigade to be more responsive to the division and ground brigades. It allows longer on-station time for aviation assets. It also permits the aviation brigade to operate in forward areas; at the same time, it reduces the logistical burden of ground maneuver units.

5-3. SUPPLY OPERATIONS

Supply is the procurement, distribution, maintenance (while in storage), and salvage of supplies, including determination of type and quantity. Supplies are the commodities required to equip, maintain, and operate a military force.

a. Classes of Supply. Aviation brigades require and use the established ten classes of supply. Definitions and examples of each class of supply are discussed below. Miscellaneous supplies include water, maps, captured enemy materiel, and salvage materiel. Supplies are further divided into subclasses. These subclasses denote requirements, such as aviation fuel--designated as Class III(A)--used by system-specific assets.

(1) Class I--Subsistence items and gratuitous health and welfare items (B-rations, MRE, and fresh fruits and vegetables).

(2) Class II--Equipment, other than principal items, prescribed in authorization and allowance tables (individual equipment, clothing, tentage, tool sets, and administrative supplies).

(3) Class III--POL, further defined as packaged and bulk POL. Class III (packaged) includes hydraulic and insulating oils, chemical products, antifreeze compounds, and compressed gases. Class III (bulk) includes aviation fuels, diesel fuel, and gasoline.

(4) Class IV--Construction and barrier materials (lumber, sandbags, and barbed wire).

(5) Class V--Ammunition such as small arms, artillery projectiles, antitank missiles, explosives, mines, bombs, and special ammunition including chemical and nuclear munitions.

(6) Class VI--Personal-demand items normally purchased through the exchange system such as candy and cigarettes. Class VI is normally requisitioned and distributed with Class I supplies.

(7) Class VII--Major end items (vehicles, self-propelled artillery pieces, missile launchers, aircraft, and major weapon systems).

(8) Class VIII--Medical material (medicine, stretchers, surgical instruments, and medical equipment repair parts). Paragraph 5-17 further describes Class VIII supplies.

(9) Class IX--Repair parts and components, including kits and assemblies, and items required for support of all equipment (batteries, spark plugs, and fuel lines).

(10) Class X--Materiel required to support civil affairs operations such as a commercial-design tractor for use by local civilians.

b. Categories of Supply. Supplies are requested and issued using three categories of supply: scheduled, demanded, and regulated.

(1) Scheduled. Scheduled supplies may be reasonably predicted. Requisitions are not usually required for replenishment. Requirements are based mainly on troop strength, equipment density, forecasts, or daily usage or a combination of these factors. Scheduled supplies are normally shipped to users based on preplanned distribution schemes. Classes I, III (bulk), V, and VI are typically scheduled supplies. Classes I and VI are based on troop strength; Class III (bulk) is based on long-range forecasts, equipment densities, and historic usage factors; and Class V is based on densities of weapons and the mission.

(2) Demanded. A requisition must be submitted for demanded supplies. Items in Classes II, III (packaged), IV, VII, and IX are considered demanded supplies.

(3) Regulated. Regulated supplies may be scheduled or demanded. However, the commander and his staff must closely control these supplies because of scarcity, high cost, or mission needs. Any item or group of items may be designated as regulated; normally some items in Classes II, III (bulk), IV, V, and VII are regulated. If an item is regulated, the commander who so designated it must approve its release before it is issued. Items designated as command-regulated are identified in operation plans and orders.

c. Methods of Distribution. Supplying units distribute supplies to using units by two methods: supply point distribution and unit distribution. Aviation brigades use both methods.

(1) Supply point distribution. In supply point distribution, the supplying unit issues supplies from a supply point to a receiving unit. The receiving unit must go to the supply point and use its own transportation in moving the supplies to its area.

(2) Unit distribution. In unit distribution, the supplying unit issues supplies and delivers them to the receiving unit's area in transportation assets that the supplying unit has arranged. Throughput is a form of unit distribution in which shipments bypass intermediate supply points or installations. Throughput eliminates the need for double handling. Throughput thus reduces exposure to pilferage and damage. It results in more

efficient use of transportation assets; it is also more responsive to the needs of users. Aviation brigades and subordinate units often employ the unit distribution method of supply.

d. Requisition and Distribution of Supplies.

(1) Class I (and Class VI when applicable).

(a) Class I ration requests are consolidated by subordinate battalions and separate companies. They are forwarded through the aviation brigade or the appropriate support area, if operating independently, to the appropriate MMC. These requests are based on personnel strength.

(b) The supporting Class I distribution point forwards requests to the MMC. The MMC has the rations shipped to distribution points; there the units can pick up the rations via supply point distribution. Normally, a water point is collocated with the Class I point. Rations are segregated in unit lots or item piles; or the truck-to-truck method may be used. Extra rations are usually not available at distribution points. Therefore, ration requests must accurately reflect personnel present for duty, to include any attached personnel.

(c) The brigade S4 generates ration replenishment requests for basic loads. He also monitors the operational ration requests. Figure 5-9 illustrates the requisition and distribution of Class I supplies.

(2) Classes II, III (packaged), IV, and VII.

(a) Units normally requisition these items. The requisitions originate at the battalion. They are consolidated at the brigade unless the battalion is operating under another headquarters. The requests are then compiled at the next support echelon such as a CSG, an MSB, or an FSB. These requests are then forwarded to the applicable MMC. Normally, the items are authorized for shipment to the supply point in the support area via unit distribution. The items are then distributed to the battalion using supply point distribution. In some cases, the items may be distributed by throughput distribution from the theater, corps, or division to subordinate battalions.

(b) The greatest activity for requesting and distributing these items occurs before combat operations begin. Many of these items are "command-controlled" because of their criticality. Figure 5-9 shows the typical flow of Classes II, III (packaged), IV, and VII.

(c) A special management system--weapon system replacement operations--replaces critical pieces of equipment for Class VII major weapon systems. The weapon system, to include personnel and ancillary equipment as well as the major end item, is selectively replaced consistent with available resources and priorities. Associated with weapon system replacement operations are the ready-for-issue weapon system, the linkup, and the ready-to-fight weapon system. A ready-for-issue weapon system has been removed from preservation. All ancillary equipment--such as fire control, machine guns,

radio mounts, and radios--has been installed. The vehicle has been fully fueled and ammunition has been stored. Basic issue items are onboard in boxes. The linkup joins a ready-for-issue weapon system with a trained crew that results in a ready-to-fight weapon system. The ready-to-fight weapon system is a completely processed weapon system with crew. The receiving unit is then responsible for local SOP mission training.

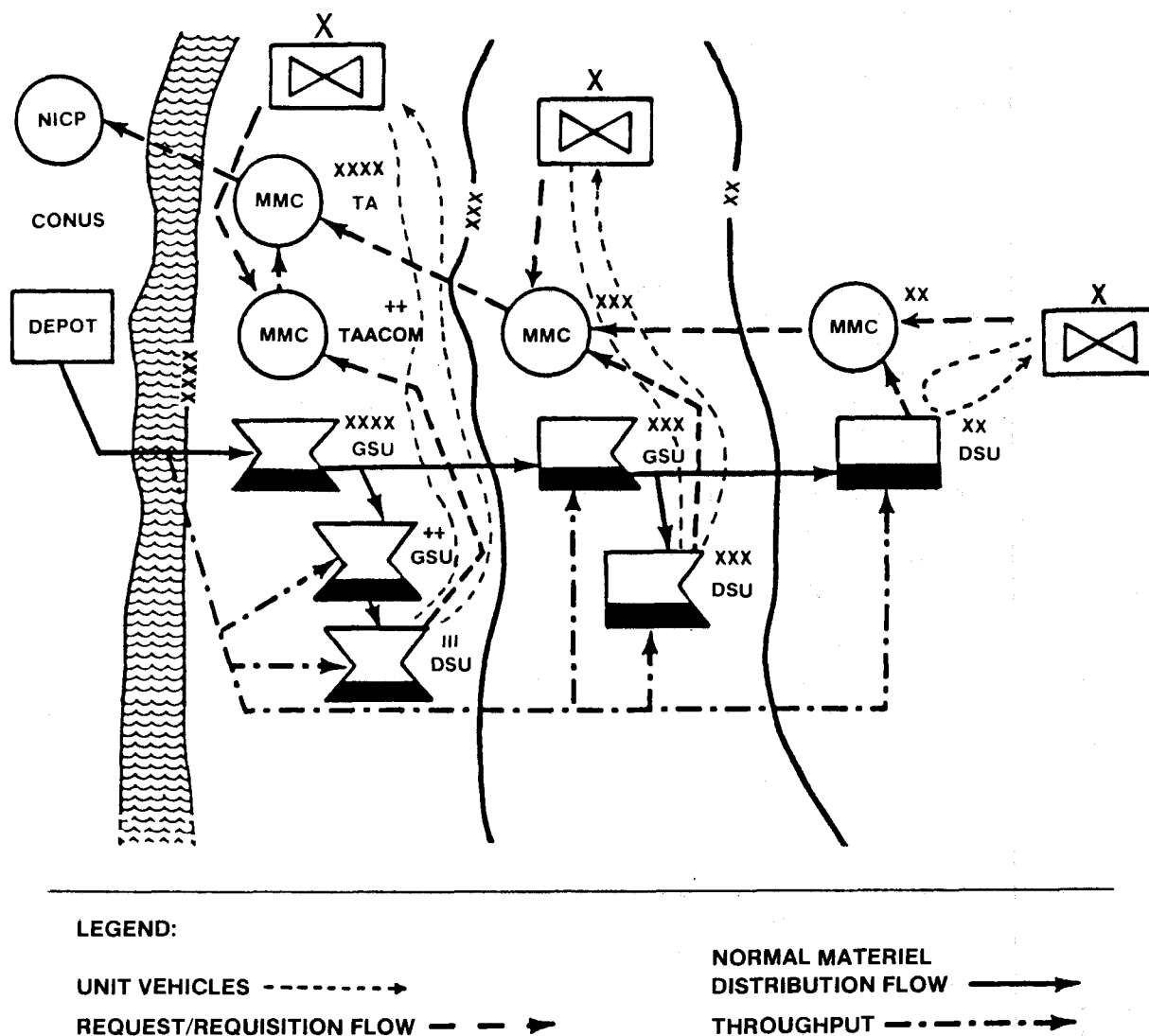


Figure 5-9. Requisition and distribution of Classes I, II, III (packaged), IV, and VII

(d) The battalion or task force executive officer is the weapon system manager for the battalion; he coordinates the efforts of the S1, the S4, and other CSS assets. The executive officer allocates weapon

system resources to companies that are supervised by the battalion S1 and S4 and their counterparts at the next higher level of command. A situation report is kept current by spot reports. The SITREP provides information to the commander and staff on the status of weapon systems within the companies. When losses occur, the appropriate requisition is placed into the system.

(e) The aviation brigade executive officer is normally the weapon system manager for the brigade. The brigade is a tactical headquarters that influences combat power largely through task organization. It is not just an administrative headquarters. The weapon system manager at the brigade level monitors weapon systems; however, he does not directly allocate them to the battalions.

(3) Class III (bulk).

(a) Units normally use fuel forecasts to requisition bulk POL. Units submit requisitions to higher headquarters to cover estimated fuel usage for a specified period. Companies and battalions estimate the amount of fuel they will require based on projected operations, usually for the period covering 72 hours beyond the next day. The battalion S4 consolidates these estimates. He then forwards them through the brigade S4 or supporting unit to the appropriate MMC; the MMC coordinates to have the fuel available in or near the support area when it is needed by the units.

(b) Bulk POL is delivered to the support area Class III supply point by unit distribution. The battalion fuel trucks may be issued the fuel at this supply point. Then they return to the battalion area either as a part of logistics packages or to refueling points in battalion FARPs.

(c) The basic load of Class III (bulk) for the battalion is the hauling capacity of the unit's fuel vehicles and the capacity of the fuel tanks on all the battalion's vehicles. Topping off vehicles when possible, regardless of the fuel level of the vehicle, is essential to continuous operations.

(d) Class III(A) for the division and corps aviation brigade is delivered by corps assets; TA aviation receives its fuel from the petroleum battalion at theater. The division can store a one-day supply of JP4 with division assets. This fuel is stored and distributed from collapsible bladders or a 5,000-gallon tanker trailer. JP4 normally is delivered to the MSB and routinely delivered by corps as far forward as the BSA for the aviation brigade as a wholesale customer. However, it may be delivered as far forward as combat trains (FARP) in specific situations. The FSB is not yet able to transfer or store JP4. However, this capability is being integrated. Figure 5-10 illustrates Class III (bulk) supply operations for aviation brigades.

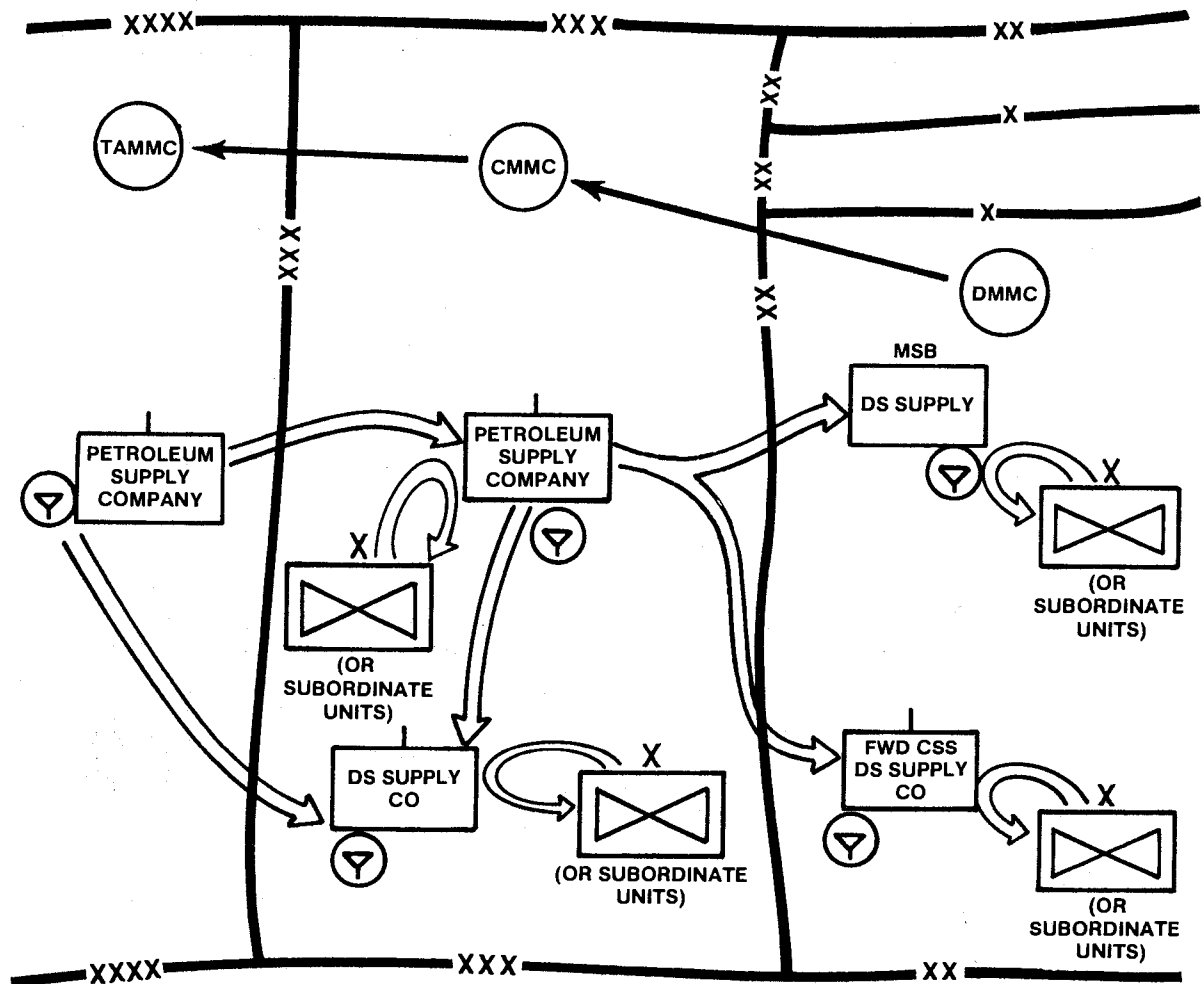


Figure 5-10. Class III (bulk) supply operations for aviation brigades

(4) Class V and Class V(A) (conventional ammunition).

(a) Conventional ammunition--Class V and Class V(A)--is the standard ammunition associated with conventional weapon systems such as M60 machine guns and weapon systems mounted on the AH-1 or AH-64. These classes include standard explosives such as hand grenades, claymores, and C-4 and

pyrotechnics (flares, star clusters, and smoke grenades). Special ammunition includes nuclear ammunition and special missile warheads and rocket motors such as Lance and Pershing missiles.

(b) The required supply rate is the estimated amount of ammunition needed to sustain the operations of a combat force without restrictions for a specific period. RSR is expressed in rounds per weapon per day. This RSR is used to state ammunition requirements. The S3 normally formulates the RSR.

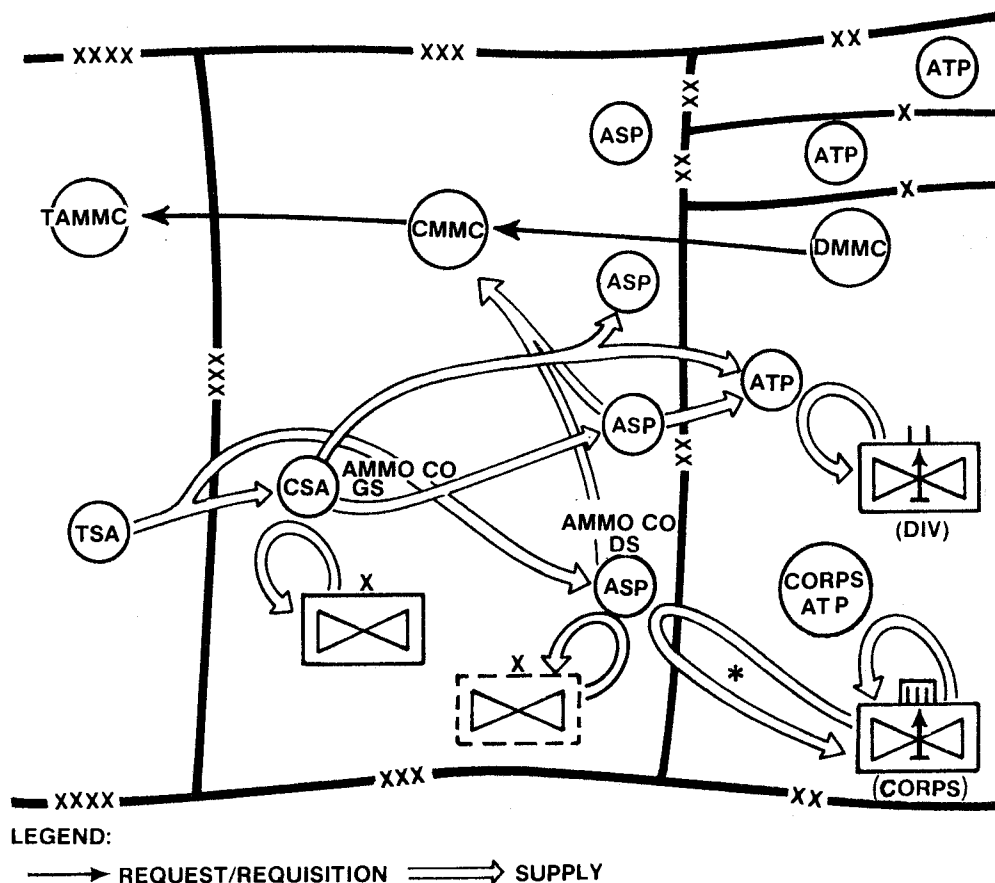
(c) The controlled supply rate is the rate of ammunition consumption that can be supported for a given period. The CSR is based on availability, facilities, and transportation. It is expressed in rounds per unit, individual, or weapon system per day. CSRs are established by the commander for his subordinate units. A unit may not exceed its CSR for ammunition without authority from higher headquarters. The S4 matches the CSR against the RSR; he then remedies shortages by requesting more ammunition, suballocating ammunition, or prioritizing support to subordinate units.

(d) The basic load is the quantity of nonnuclear ammunition authorized by the theater commander for wartime purposes and required to be designated for and carried into combat by a unit. The basic load provides the unit with enough ammunition to sustain itself in combat until the unit can be resupplied.

(e) Ammunition is normally requested by the battalion S4 on a DA Form 581 (Request for Issue or Turn-in of Ammunition); this form is forwarded to the appropriate MMC or designated ATP representatives. Once the request has been authenticated, the ammunition is issued by supply point distribution to the battalion or brigade Class III/V platoon trucks either at the ATP or at the corps ASP consistent with the CSR in effect.

(f) At the division, every FSB can run one ATP. These ATPs are located in the BSA and contain high-tonnage, high-usage ammunition to support all the division units operating in the brigade area. The ammunition is brought to the ATP via throughput distribution from the corps on stake-and-platform trailers. The ammunition is then transferred to the battalion trucks or off-loaded for future transfer. All other ammunition is found in the ASP in the corps support area; this area is normally located directly behind the rear of the division area. In the heavy division, small arms ammunition normally is found in the ASP; tank and TOW missile ammunition is found in the ATPs. Figure 5-11 illustrates the flow of Class V for aviation brigades.

(g) For maintenance and accountability, the theater normally stocks chemical ammunition. Chemical ammunition is deployed based on national policy and theater directives. When deployed, chemical ammunition will normally be issued at a chemical ASP that is collocated with the conventional ASP.



* CHANGING DOCTRINE MAY REDUCE THIS LOOP. A CORPS ATP MAY BE EMPLOYED IN THE DSA TO SUPPORT CORPS UNITS IN THE DIVISION SECTOR.

Figure 5-11. Flow of Class V for aviation brigades

(5) Class V and Class V(A) (special ammunition). Nuclear ammunition requires special authorization and handling. Nuclear ASPs are set up by theater and corps special ammunition units to store and distribute nuclear ammunition. A firing unit is given a prescribed nuclear load. This load tells the unit the amount of nuclear ammunition that the unit is authorized to carry. These allocations allow the commanders to plan the number and type of strikes they will be authorized for a given time. The establishment of these PNLs and allocations do not constitute authority to fire the ammunition. These allocations also do not mean that the commander has physical custody or possession of the ammunition. It takes a command directive to stock or replenish PNLs. All special ammunition is controlled by the NCA through the Joint Chiefs of Staff. Stringent physical security and technical maintenance requirements apply to all nuclear ammunition.

(6) Class IX and Class IX(A).

(a) Class IX is normally managed by the MMC. Class IX is maintained by the maintenance units at the various levels of command. Within the subordinate aviation battalions, the AMC (AVUM) maintains prescribed load

e. Support by Host Nation. Logistics and transportation may be provided by host nation organizations and facilities. Common classes of supply may be available and obtained from local civilians. Items may include barrier and construction materials, fuel for vehicles, and some food and medical supplies. Requisition and distribution are coordinated through logistics and liaison channels.

5-4. VEHICLE AND EQUIPMENT MAINTENANCE AND RECOVERY

The maintenance system is organized around forward support. All damaged or malfunctioning equipment should be repaired on-site or close to the site. Thus timely repairs can be made, which keeps most equipment operationally ready. Maintenance is normally performed at four levels--unit, DS, GS, and depot. The principles used to implement this concept are discussed below.

a. Flexible Unit Structure. In a flexible unit structure, maintenance forces are tailored to the weapon systems they are supporting. For example, maintenance support teams, formed from DS maintenance units, are weapon system specific; these teams are placed forward to support the brigade. Another example is the formation of BDA teams within company and battalion trains for quick, accurate assessments. These teams expedite rapid vehicle recovery or evacuation to the level of support needed to correct the problem. Individual operators and users of assigned equipment perform unit maintenance. Each piece of equipment requires preventive maintenance checks and services. This maintenance category also requires scheduled and unscheduled inspections and replacement of some components. Unit maintenance maximizes the operational readiness of equipment by preventive maintenance and early diagnosis of problems. This level of maintenance is found in companies and battalions.

b. Direct Support. In DS, maintenance units are organized to repair weapon systems quickly. These repairs enable systems to be operationally ready. DS maintenance units offer one-stop maintenance service to the supported units. They provide extensive maintenance expertise and capabilities and repair parts supply support to units in the brigade. DS maintenance units are tailored to weapon systems within the brigade. They have extensive component repair capabilities. This level of maintenance is normally found in the maintenance company of the FSB and MSB of the DISCOM and in corps and theater maintenance units.

c. General Support. In GS, maintenance units repair items in support of the supply system. GS maintenance is characterized by extensive component repair capability. It supports the supply system within the theater by repairing damaged systems for issue through the supply system as Class II, VII, or IX items. This level of maintenance is normally found in corps and TA assets. In wartime, GS maintenance may be selectively curtailed to free personnel for DS work.

d. Depot Maintenance. Overhaul and rebuilding operations characterize depot-level maintenance. This category of maintenance is normally associated with US Army Materiel Command activities. This command supports the overall

DA inventory management program. These activities are normally confined to CONUS-based depots; however, limited depot maintenance is found in the theater.

5-5. VEHICLE AND EQUIPMENT RECOVERY PROCEDURES

FM 20-22 describes technical aspects of recovery. The recovery manager coordinates recovery operations with the overall repair effort to best support the commander's priorities and the tactical situation. The goal is timely return of equipment to operation with the least expenditure of resources.

a. Recovery Principles. The general principles below apply to recovery operations.

(1) The preferred method of recovery is for the unit to recover its own equipment. The unit is responsible for recovering its own disabled equipment with wreckers, tow bars, and recovery teams. When it lacks the physical means to recover an item, the unit requests assistance from the supporting maintenance element.

(2) Management of recovery operations is centralized at the battalion whenever possible. This centralization does not preclude delegating recovery authority for specific operations to company maintenance teams.

(3) The commander organizes the recovery resources to best support the unit mission. Changes in the type and quantity of supported equipment, as well as the tactical situation, may require reorganization of recovery assets.

(4) Recovery operations are coordinated with the maintenance effort. Maintenance personnel repair equipment as far forward as possible within the limits of the tactical situation, amount of damage, and available resources. Repair or recovery decisions are based on maintenance time guidelines. The estimated repair time helps determine the maintenance activity to which the item should be recovered.

(5) A 24-hour capability is required. Operations require continuous, responsive recovery support. Roadside recovery operations on an area basis may be rotated among maintenance units to provide recovery support beyond the capability of using units.

(6) The proper recovery equipment is used for the recovery mission. Wreckers normally recover wheeled vehicles; tracked recovery vehicles recover track equipment. However, the best available recovery vehicle is used to support an increasing workload with a limited number of recovery assets. For example, if a lighter recovery vehicle is not available, a heavier vehicle, such as a medium recovery vehicle (M88), may have to recover an armored personnel carrier.

(7) Recovery vehicles return equipment no farther to the rear than necessary, usually to the maintenance collection point of the supporting maintenance unit. Thus recovery vehicles are kept available in the forward areas. DS units use heavy equipment transporters to evacuate heavy items received from using units.

(8) Accurate location information is provided to the recovery manager and crews. Ground guides may be required when specific location information is not available or where the tactical situation is not well defined.

(9) Route selection for the towing of multiple vehicles is important. Safe operation requires that the combined load not exceed the recovery vehicle's braking ability on a steep grade.

(10) Recovery missions that might interfere with combat operations or compromise security are coordinated with the tactical commander concerned. When recovery assets are limited, the commander sets the priority based on his need for the item and the tactical situation. The type of disability also affects the priority when two or more like items must be recovered. In general, combat vehicles are recovered first.

b. Priority Sequence. The following sequence usually provides the maximum return for recovery effort expended:

- Classified items.
- Terrain-stuck items.
- Items with failed or damaged components needing little repair.
- Items requiring long recovery and repair times before they are returned to service.
- Contaminated items.
- Uneconomically repairable items.
- Enemy materiel.

c. Alternatives. Local options are considered and tried before a recovery mission is attempted. Field-expedient repair and self- or like-vehicle recovery may do the job without a recovery vehicle.

d. Recovery Support. Recovery support is provided on a unit or an area basis. Using units normally provide support on a unit basis. Maintenance units may have an area support mission for using unit backup support for out-of-sector units operating in the area.

e. Recovery Initiation. Equipment recovery begins where the item became disabled.

(1) When the equipment operator or crew member detects an inoperable condition, he assesses the damage. He then acts based on his analysis and the tactical situation.

(2) The equipment operator or crew member informs the chain of command. The unit SOP prescribes notification procedures; these vary based on the type of unit, equipment, communications available, tactical situation, and location of equipment. Combat vehicles usually have radio communications. Other means may have to be used for reporting on disabled tactical and administrative equipment. Lack of communication for out-of-sector equipment requires the operator or crew member to act independently; he may have to coordinate directly with other units in the area or with the supporting maintenance unit for repair or recovery support.

f. Ground Support Equipment Maintenance.

(1) Commanders are aware of the readiness status of their GSE at all times. This equipment assists maintenance personnel in performing their maintenance tasks. A poor state of maintenance may be due to repair and operation of the equipment by untrained personnel. Commanders and maintenance personnel watch for signs of equipment neglect such as--

- Overdue inspection dates.
- Little or no stockage of repair parts.
- Missing maintenance records.
- Storage of end items for long periods.
- Leaks and missing parts.
- Improperly marked or painted equipment.
- Dirty equipment.
- Missing BII.
- Malfunctioning equipment.

(2) Though not all-inclusive, these indicators provide the commander and maintenance personnel with a general idea of the status of the GSE of the unit. Equipment often continues in a nonmission-capable status because parts are difficult to obtain. Supervisory personnel ensure that this shortage does not result from poor supply requisitioning procedures and uncontrolled cannibalization. All personnel should be aware of the importance of GSE to the overall mission. They must ensure that GSE is properly operated and maintained.

(3) The light maintenance company of the MSB provides DS for GSE in the aviation brigade.

5-6. AVIATION MAINTENANCE

On the modern battlefield, aviation maintenance is performed on a 24-hour-a-day basis. The governing concept is to "replace forward, repair rear" so that aviation units can rapidly return aircraft to meet immediate battle needs. Damaged or inoperable aircraft that require time-consuming repair actions are handled in more secure areas toward the rear. Aviation maintenance is divided into two categories--scheduled and unscheduled.

a. Scheduled Maintenance. Scheduled maintenance includes predetermined cyclic inspections of aircraft systems and replacement of components. These recurring events are scheduled either on a calendar or flying-hour basis. The frequency of inspections or replacements is listed in each aircraft technical manual. The intervals stated in these manuals are maximum intervals that will not be exceeded except during critical combat operations when authorized by the unit commander. All-inclusive airframe and subsystem inspections are performed (in different depth) at daily and phased intervals. The exact calendar or flying-hour scheduled maintenance intervals may differ by type of aircraft. During critical battlefield situations, the potential of grounding aircraft or overflying scheduled maintenance events should be avoided. All imminent scheduled maintenance should be accomplished before deployment or entry into surge operations. This consideration includes aircraft being initially deployed to the battlefield or those already there that are being prepared for surge operations. The guidelines, standards, and limitations for early action are included in SOPs governing specific operations. The following options should be considered when scheduled maintenance is delayed: MSTs from AVIM support, continuous operations, "running" phases, or deferral of maintenance according to TM 1-1500-328-25.

b. Unscheduled Maintenance. Unscheduled maintenance is maintenance that is generated by premature or unexpected aircraft system or component malfunction or failure or that is required to correct damage incurred from improper operation or battlefield activity. Because it is not predictable, units must be doctrinally and organizationally prepared to apply responsive corrective action on an as-needed basis. The aircraft combat maintenance and battlefield damage repair concept, discussed in paragraph 5-9, applies to such occasions. FM 1-500 covers Army aviation maintenance in more detail.

5-7. SUPPORT SYSTEM STRUCTURE

The support system is composed of a three-level structure: aviation unit maintenance, aviation intermediate maintenance, and depot maintenance. AVUM and AVIM organizations are found on the battlefield; they are addressed in the maintenance allocation charts. Specific organizational structures vary somewhat, depending on whether they are in a division (light or heavy) or corps. The basic concepts of aircraft maintenance are discussed below. These include tasks and procedures within AVUM and AVIM organizations and AVUM-AVIM unit coordination. The repair manual for each aircraft contains allocation charts that give specific tasks assigned to each level.

5-8. AVIATION UNIT MAINTENANCE

a. AVUM is the responsibility of all operational aviation units. Unit maintenance operations should ensure that the maximum number of reliable, fully mission-capable aircraft are available to the battlefield commander. The general concept is for crew chiefs assigned to specific aircraft to perform daily servicing, daily inspections, limited troubleshooting, and high-frequency, remove-and-replace aircraft repairs. Normally, an AVUM element within the organization performs scheduled maintenance (other than daily inspections) and the more time-consuming operator-level repairs. In the attack battalion, for example, crew chief maintenance is performed by attack company personnel. AVUM assets within the battalion accomplish the scheduled and unscheduled maintenance and longer-duration repairs. Specific structures differ among different organizations, including battalions and companies within the same division.

b. During operations, most AVUM platoons or companies are located in the forward portion of the support area. However, depending on the situation, elements of the AMC (AVUM) may be found in the appropriate support area, battalion trains, or battalion FARP. The AMC (AVUM) maintains aircraft brought to rear areas; it also sends teams forward to assist with on-site aircraft combat maintenance and battle damage repairs and to recover downed aircraft. AVUM assets may also have to assist AVIM support in completing maintenance requirements such as phases.

c. In some situations, normal maintenance procedures must be expedited to meet battle objectives. In such cases, the unit commander authorizes the use of aircraft combat maintenance and battle damage repair procedures. Aircraft combat maintenance and battle damage repair is an AVUM responsibility with backup from supporting AVIM units. The concept uses specialized assessment criteria, repair kits, and trained personnel to moderate, within the bounds of flight safety, peacetime aircraft maintenance standards. Thus damaged aircraft can be returned to the battle as soon as possible. Often, such "return to battle" repairs are only temporary. Permanent repairs may be required when the tactical situation permits. The aircraft combat maintenance and battle damage repair system multiplies force capability in a combat environment by augmenting the existing peacetime maintenance system.

d. The aircraft combat maintenance and battle damage repair team is formed from AVUM platoon assets. A typical team has a trained inspector (MOS 66/67) for damage assessment, two or three repairers (MOS 67/68), and a maintenance test pilot. The makeup of a team for a specific mission depends on the maintenance work anticipated.

e. The team uses aircraft combat maintenance and battle damage repair manuals. These contain revised aircraft damage assessment criteria and repair procedures. The manuals are formally processed, validated publications for use only in combat environments and as authorized by the unit commander. They are prepared for each type of aircraft and contain combat damage inspection and assessment techniques. They provide combat area maintenance serviceability and deferrability criteria and expedient repair

procedures for quick-fix or temporary repairs. They also contain cannibalization techniques for quick removal of critical components and structures from unrepairable and nonrecoverable aircraft.

f. The aircraft combat maintenance and battle damage repair team will use specially designed combat repair kits for repairing major aircraft systems. These suitcase-size tool kits can be carried by one person. The tools and materials will permit the team to make quick and temporary combat damage repairs.

g. An aircraft may be forced down on the battlefield. In this case, the aircraft combat maintenance and battle damage repair procedures below apply as time and security allow.

(1) The aircraft commander, or one of his crew, uses the aircraft radio, if it is operable and the tactical situation permits, to notify the parent AVUM commander of the problem. He requests aircraft combat maintenance and battle damage repair assistance. This information may have to be relayed through other aircraft operating in the area. The information includes--

- The location of the down site, an assessment of security, and the adaptability of the site--to include existing weather conditions--for inserting an aircraft combat maintenance and battle damage repair team.
- The existence or evidence of chemical contamination.
- The enemy situation to include the ADA threat.
- An evaluation of aircraft damage so that aircraft combat maintenance and battle damage repair personnel, equipment, and parts requirements can be estimated.
- The condition of the crew and passengers and their ability to continue the mission or assist in repairing the damage. For example, the aircraft commander may be able to fly the aircraft out; therefore, an aviator would not be needed on the aircraft combat maintenance and battle damage repair team.
- The accessibility to the downed aircraft.

(2) The AVUM unit commander authorizes the dispatch, normally airlift, of an aircraft combat maintenance and battle damage repair team to the site. The team will carry manuals, repair kits, materials, and repair parts.

(3) The initial on-site inspection by the team will determine the extent of damage. It also will provide the information necessary for a decision on whether to--

- Clear the aircraft for immediate return to battle, deferring any damage repairs to a later time.
- Apply permanent repairs, returning the aircraft to a completely serviceable condition.
- Apply temporary repairs that will safely allow return of the aircraft to meet immediate battle needs, deferring higher-standard permanent repairs to a later time.
- Repair the aircraft to allow a one-time flight back to a more secure and better equipped maintenance area.
- Rig for aerial or ground recovery and make the necessary recovery arrangement; that is, repair is infeasible at the repair site.
- Cannibalize critical components and abandon or destroy the aircraft, if directed; that is, repair or recovery is infeasible.

(4) One of the assessor's primary tasks is to determine the location of the damaged aircraft in relation to the battlefield and the extent of the threat. AD threats may make aerial recovery in forward areas of the battlefield impractical or of an unacceptably high risk. The assessor must be able to rapidly determine whether a one-time flight is feasible or if a quick-fix repair is possible. Thus aircraft may not have to be destroyed (in place) to prevent capture or compromise. Once the battle subsides, maintenance decisions are based on standard operational maintenance practices. Deferring maintenance tasks is a "fly now, pay later" concept. Postponing maintenance increases availability for short periods only.

5-9. AIRCRAFT RECOVERY OPERATIONS

a. Aircraft recovery operations move inoperative aircraft from the battlefield to a maintenance facility. When an aircraft cannot be fixed for self-powered evacuation from the down site, it is prepared for movement directly to the first appropriate maintenance activity, using another aircraft or a surface vehicle. FM 55-413, which will be replaced by FM (J)1-513, contains detailed procedures for preparing for and performing recovery operations for specific aircraft.

b. Aircraft recovery (Figure 5-13) is the responsibility of the aviation operational unit, using its AVUM assets, within the limits of its organic lift capability. Supporting AVIM units provide backup recovery support when aviation units are overloaded or complex aircraft disassembly is required. When medium helicopter support is required, corps assets are normally requested. Recovery operations require a highly coordinated effort among the owning organization, its AVIM support, the ground element in whose area the recovery takes place, and any organization providing aircraft or vehicle

assets to complete the recovery. Aircraft recovery responsibilities for aviation brigades in light infantry divisions are usually fulfilled strictly by AMCs (AVIM) or corps assets. Overall control of the recovery rests with the TOC of the aviation brigade.

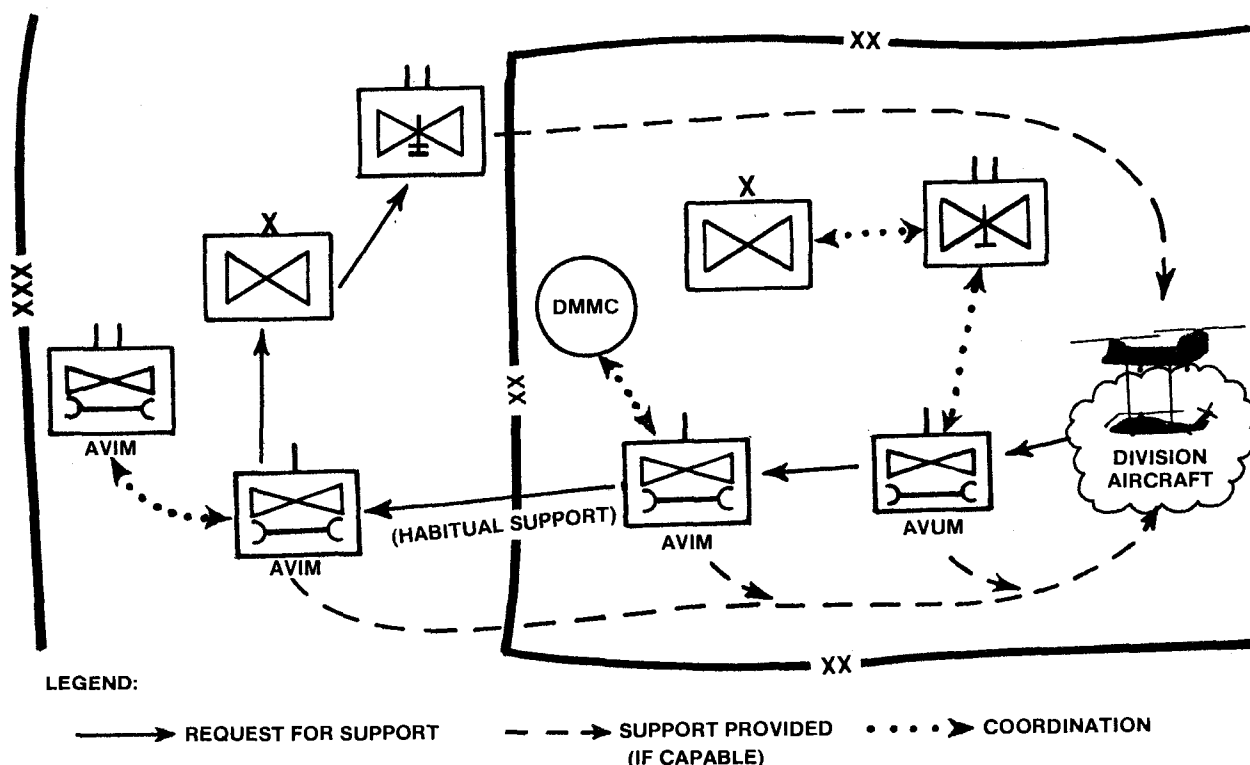


Figure 5-13. Division aircraft recovery

c. Each AVUM organization prepares for aircraft recovery contingencies by designating an aircraft recovery team to be dispatched to downed aircraft sites as the situation requires. This team consists of maintenance personnel, a maintenance test pilot, and an aircraft inspector, who are trained in preparing aircraft for recovery. The team chief ensures that appropriate rigging and recovery equipment is identified, available, and prepared for short-notice recovery missions. The size and composition of the team depend on the type and size of the disabled aircraft, type of recovery aircraft or vehicle used, and length of time the recovery area remains accessible. The aircraft combat maintenance and battle damage repair team and the recovery team are sometimes the same.

d. When a downed aircraft cannot be flown out under its own power, the recovery team determines the best method of recovery and implements that recovery action. The basic decision is whether to use surface or aerial means to recover the aircraft. Figure 5-14 shows recovery by corps aviation assets as well as by ground vehicles.

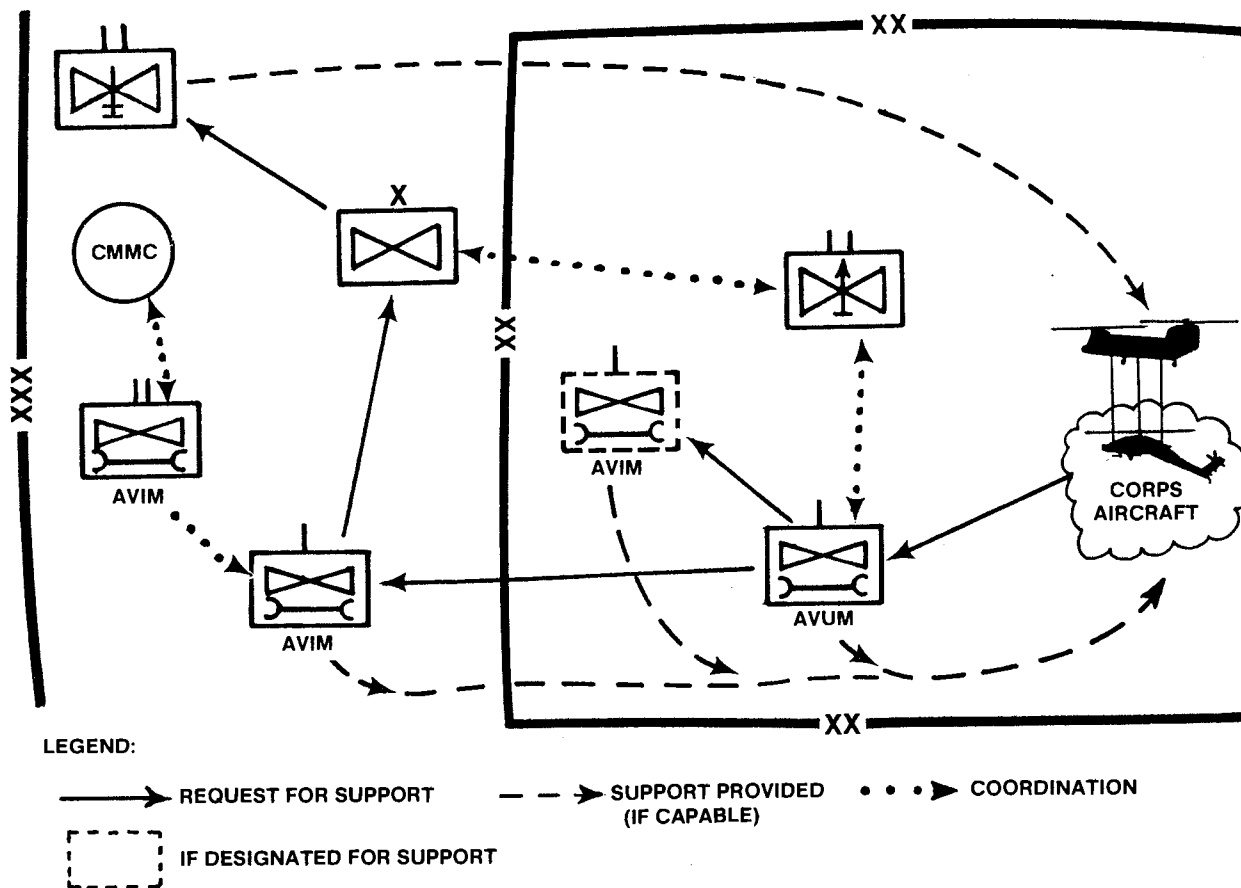


Figure 5-14. Corps aerial recovery and division ground recovery

(1) Surface recovery. Surface recovery and evacuation use ground equipment and wheeled vehicles to deliver a disabled aircraft to a maintenance facility. The planning of a surface recovery follows logical steps. First is an evaluation of the aircraft to be recovered, the type of equipment and transportation means required for the recovery, and thorough reconnaissance and evaluation of available ground routes to and from the recovery site. Further considerations include the characteristics of the recovery site and factors concerning the tactical situation. These factors include likely enemy avenues of approach, minefields, actions to minimize the danger of booby traps in downed aircraft, tactical cover, and the need for escort troops or aerial security to protect against ambush. Surface recovery, when compared to aerial recovery, has both advantages and disadvantages.

(a) Advantages.

- Enemy forces are unable to detect the movement of recovery assets unless enemy forces are relatively near those movement routes.
- Recovery equipment malfunction is unlikely to result in total loss of the aircraft during transport.

(b) Disadvantages.

- The overall lapsed time for the recovery operation is much greater than that for aerial recovery. For example, recovery personnel and equipment assets are tied up for a long time; the threat is increased because of relatively long exposure time on the battlefield with slow-moving equipment.
- Often, a great amount of aircraft disassembly or modification is required to adapt the aircraft to surface travel. For example, shortening of height dimensions may be required to accommodate overhead road clearances.
- Ground routes must be accessible.
- Reconnaissance of the route must be meticulous.
- Surface recovery may tie up route security assets that are greatly needed elsewhere.
- Loading procedures and rough terrain travel can further damage the aircraft.

(2) Aerial recovery. Aerial recovery is accomplished by preparing the aircraft for movement, attaching suitable airlift recovery equipment and connecting it to the lifting helicopter, and flying the aircraft to the maintenance area. Planning for aerial recovery entails thorough analysis of the recovery site characteristics and the threat associated with relatively slow air movement over the battlefield. Aerial recovery, when compared to ground recovery, has both advantages and disadvantages.

(a) Advantages.

- It is much faster, minimizing the time consumed by recovery assets and reducing battlefield exposure time.
- Route reconnaissance requirements are considerably less.
- Less aircraft disassembly is required.
- Recovery site accessibility requirements are not as rigid.
- Security escort requirements are usually less.

(b) Disadvantages.

- Aircraft can be completely lost if recovery equipment fails. For example, the aircraft could be dropped because of faulty slings or improper hookup procedures.
- Although exposure time is less, the distances from which recovery is detectable are much greater.
- Loss of recovery assets through enemy action will more severely degrade total force fighting capabilities. Degradation occurs because of the versatility and relatively few numbers of utility and cargo helicopters, particularly medium-lift helicopters, in comparison to ground recovery vehicles.

5-10. AVUM MOBILITY

a. Frequent and rapid relocation is typical of unit operations on the battlefield. This is particularly true for assault and attack helicopter assets. The AVUM element is normally separated from these companies, reducing the comparative number of moves. However, the AVUM commander still prepares to relocate the unit, or portions of it, often. During surge operations, these moves may be made as often as every 24 hours, based on METT-T. Frequent relocation of the platoons greatly affects maintenance operations. Critical assets--FARPs and aviation maintenance contact teams--move throughout the battlefield similarly. They are organized and equipped to ensure 100 percent transportability and mobility. Thus maximum support is provided to aviation forces.

b. Mobility-related factors must be taken into account. The major ones are discussed below.

(1) The AVUM and unit support assets within the HHC that are not critical do not normally move at such a rapid pace. AVUM and HHC assets are typically located in the brigade rear area and do not require 100 percent mobilization but rather 100 percent transportability. The percentage of mobility depends on the criticality of equipment requiring "first load" movement. The frequency and rapidity of moves again depend on METT-T. An AVUM or a supporting asset may not be able to sustain maintenance support for aviation operations if it moves every 24 hours.

(2) Maintenance capabilities are greatly reduced during moves. At least a four-hour loss of productive maintenance time can be anticipated at each end, plus actual movement time. Work should continue on critical aircraft repairs while other elements prepare the unit for movement. When movement is likely, aircraft requiring repairs that cannot be completed within two hours are evacuated to AVIM.

(3) As a rule, during movements, communication and coordination between the AVUM element and the companies it supports are extremely difficult.

5-11. AVIATION INTERMEDIATE MAINTENANCE

Aviation maintenance companies (AVIM) provide support-level maintenance for AVUM and operating organizations. AVIM units are either divisional or non-divisional. In terms of maintenance responsibility, they serve as the bridge between units that own and operate aircraft on the battlefield and production line and overhaul depots located away from the battlefield. The goal of AVIM units in combat is the same as that of AVUM units--to provide the battlefield commander with the maximum number of fully mission-capable aircraft.

Divisional and nondivisional AVIM units perform similar support functions.

a. Divisional AVIM Units. A divisional aviation maintenance company (AVIM) is assigned as a separate company organic to the DISCOM. This company is structured to support the specific aircraft assigned to the division. These aircraft are usually observation, utility, and attack helicopters. Because of its aircraft density, the air assault division--which also has medium helicopters--has an aviation maintenance battalion (AVIM) with two maintenance companies. It supports the aviation brigade by providing AVIM and backup AVUM-level support at its base location in the DISCOM area and forward team support in the operating unit areas.

(1) Base area maintenance. The main body of the AVIM unit is located in one of the rear support areas, usually the DISCOM. The unit performs extensive on-aircraft systems maintenance, including structural and airframe repairs. It repairs components for immediate reinstallation on aircraft or to support its organic direct exchange program. It also performs AVIM-level scheduled maintenance and maintains the division Class IX(A) ASL to support unit PLL stocks. The unit serves as the next-level processing agency for aviation brigade supply transactions under an automated system, including the receipt, storage, and issue of repair parts and the control and distribution of aviation intensive management items. When the work load for an AVIM unit becomes too great, some of the work load is cross-leveled, or transferred, to a nondivisional AVIM unit.

(2) Forward team maintenance. The AVIM unit dispatches teams forward to assist operating units with AVUM overload situations, aircraft combat maintenance and battle damage repair actions, and aircraft recoveries. The functions of AVIM aircraft combat maintenance and battle damage repair and recovery teams are the same as those for AVUM-level teams. Such forward support is on an as-requested basis. When a unit commander encounters or anticipates a need for AVIM forward assistance, he makes the request through procedures prearranged and detailed in external support agreements or SOPs. The commanders at AVUM and AVIM levels prepare SOPs and coordinate them with all organizations concerned, ensuring that they are updated immediately upon situational changes. Guidance includes--

- Factors of METT-T.
- Request procedures and criteria.
- Communication nets.

- Security agreements.
- Team composition requirements.
- Tactical considerations.
- Equipment requirements.
- Team administrative support provisions.
- Any data unique to the requirement circumstances.

b. Nondivisional AVIM Units. Nondivisional aviation maintenance companies (AVIM), normally located in the corps area, support corps nondivisional aviation assets and back up divisional AVIM companies. The aviation maintenance battalion can control from two to eight nondivisional AVIM units. The nondivisional AVIM company provides the full scope of support services to nondivisional aviation units; in its backup role and as the need arises, it also performs all the functions normally tasked to the divisional AVIM in support of its aviation brigades. This support includes forward team maintenance and recovery actions. All divisional AVIM units are structured to transfer 25 percent of their workload to their supporting nondivisional AVIM units. This transfer may reach higher levels in the light infantry division; in that case, the supporting nondivisional AVIM unit is augmented to provide the additional support required. The cross-leveling of nondivisional work is managed by the aviation maintenance battalion. The divisional AVIM employment discussed above also applies to the nondivisional AVIM unit, except for differences in the organizational and battlefield placements of divisional and nondivisional AVIM companies (divisional in DISCOM, nondivisional in corps).

5-12. AVIM MOBILITY

a. AVIM units are located on a more permanent basis. Frequent and rapid moves greatly disrupt maintenance activities. AVIM contact teams and other critical elements are required to be 100 percent transportable and mobile to provide critical and rapid support to aviation units. The entire AVIM does not need to be 100 percent mobile. Using organic assets, divisional and corps AMCs are required to be 50 percent mobile. AVIM units may have to rapidly relocate to the corps rear area, particularly during defensive operations, to ensure adequate facilities and time to complete heavy maintenance requirements such as phases. Normally, divisional AMCs move every three to seven days and corps AMCs, every eight to ten days. However, METT-T and the commander's intent may dictate otherwise.

b. Major mobility-related factors should be considered. These are discussed below.

(1) Maintenance capabilities are greatly reduced during moves. At least a six-hour loss of productive maintenance time can be anticipated, plus actual movement time.

(2) When movement is likely, provisions are made for the disposition of aircraft requiring repairs that cannot be completed within four hours. Depending on the specific situation, this disposition entails coordination with corps for use of medium-lift helicopters for air evacuation and preparation of aircraft for one-time flights or whatever other options are available. This requirement poses a significant problem; most of the aircraft at AVIM level are in for repairs that require more than four hours. Upon arrival at a new location, an AVIM commander assesses the capability of conducting the next move. Then he coordinates the necessary support for the move prior to the requirement, particularly the evacuation of inoperable aircraft.

5-13. NIGHT AIRCRAFT MAINTENANCE

a. AirLand Battle doctrine calls for full around-the-clock aviation operations. This doctrine requires 24-hour-a-day aircraft maintenance capabilities. Working on aircraft day and night appreciably shortens calendar repair time for aircraft undergoing major maintenance. Maintenance completed at night on aircraft that have flown all day allows those same aircraft to be assigned to missions early the next day.

b. Light discipline is imperative to night maintenance activities on the modern battlefield. When a unit operates close to the FLOT, light suppression precautions must be more restrictive. Maintenance actions should be centered around performing tasks inside closed blackout shelters, as opposed to working outside with subdued lighting devices. Units work with self-powered light under lightweight portable blackout enclosures that can be easily moved from one aircraft or location to another. Forward night maintenance inside large (full aircraft) lighted blackout shelters is only performed if enough internal lighting can be provided without the need for noise-producing power generators.

c. Units operating toward the rear normally are accorded more latitude in terms of distance from which enemy detection must be considered. Rigid blackout provisions still apply to all inside white light work; however, certain tasks are allowable outside, using subdued lighting devices. The degree of detection avoidance on the battlefield is determined case by case. Generally, units operating farthest to the rear perform maintenance functions (AVIM) of such magnitude that some of the work must be done outside shelters.

d. The scenario plays a major role in determining the extent of night maintenance that can be performed safely and effectively. The open desert terrain of the Mideast scenario lends itself to long-distance visibility of the faintest light; that same light is not detectable from a comparable distance in the forested, hilly European scenario.

e. Certain tasks can be done at night if light discipline is used. However, maintenance jobs that require rotor blade turning or engine run (rotor track, fuel control adjustment) are done outside and generally require significant area lighting. Thus adequate light discipline is imposed and tasks are delayed until daylight.

f. There is no single, all-encompassing definitive concept for night aircraft maintenance operations. Each organization establishes and alters its plan for implementing night operations as specific environmental conditions and changes in threats are encountered. That is, as a unit moves forward into more open terrain, its night maintenance considerations are considerably different from when it moves rearward or into a more closed environment.

g. Commanders establish comprehensive, flexible procedures for conducting night maintenance operations. The procedures include--

- Light discipline criteria.
- Production control adjustments.
- Quality control requirements.
- Changes of day-night shift transitions.
- Impact of human factors.

In developing procedures and criteria, the safety-of-flight standards must be maintained at the same level as those for daytime maintenance; also, the security of the unit must not be compromised. FM 1-500 contains detailed night maintenance considerations.

5-14. MAINTENANCE IN UNUSUAL ENVIRONMENTS

a. Commanders are aware of the unique implications of performing aircraft maintenance in unusual environments. They ensure that preparations are made before operating in such areas. Often, maintenance procedures employed in one environment are not appropriate for another. Operations may be conducted in climatic or terrain extremes.

b. FM 1-500 lists special considerations for operating in such areas. Commanders look at the effect of the environment on factors such as--

- Modifications to normal repair parts stockage levels (for example, increased numbers of filters, bearings, and seals when operating in wind and sand).
- Mobility and transportation restrictions (mountains, heavy foliage, ice).
- Personnel and equipment performance degradation (altitude, excessive heat or cold).
- Light discipline requirements for night operations.
- Communications restrictions.
- Special shelter requirements.

- Modifications to normal scheduled and preventive maintenance schedules.
- Specialized equipment and clothing requirements.

5-15. TRANSPORTATION

a. Transportation is the movement of personnel, materiel, and equipment from origin to destination. As a rule, it is expressed in tonnage (or number of personnel) and distance. Every logistics or personnel requirement generates at least one transportation requirement.

b. There are three types of transportation operations within the theater. These are movement management, terminal transfer operations, and modal operations.

(1) Movement management. MCCs in the TA, COSCOM, and DISCOM manage movement. Movement management consists of staff planning and coordination for effective use of the transportation system.

(2) Terminal transfer operations. These operations consist of shifting cargo from one mode of transport to another or shifting cargo from one type of transport in a mode to a different type. Shifting occurs at any intermediate point along the transportation system.

(3) Modal operations. Modal operations encompass the movement of personnel and materiel on a transportation conveyance. Four basic modes of transportation support these requirements: motor, air, water, and rail.

c. Transportation planning consists of five steps. These steps are discussed below.

(1) Determination of requirements. Initial transportation requirements are expressed in tonnages (or number of personnel) and distances. Requirements also are modified to include time or special handling requirements such as required delivery dates or oversized loads.

(2) Determination of available resources. Transportation resources are assessed. The type of transportation assets available and their characteristics and capabilities are considered.

(3) Balancing of requirements against resources. This process weighs various factors against resources available to support the stated requirement for additional transportation. Factors consist of the required workload capacity, command priorities, and availability of both organic and supporting resources. Decisions are made as to the amount and type of support to be provided; for example, whether to make two round trips with organic trucks because the supplies exceed their hauling capability and no other trucks are available.

(4) Determination of critical points. This process looks at the transportation plan. It identifies critical points when additional planning is needed to preclude bottlenecks and to ensure that the transportation system is operating at maximum capacity. Alternate plans are devised to accept various contingencies and to add flexibility to the plan.

(5) Coordination and refinement of the plan. All planners must coordinate so that support is integrated. After initial coordination takes place, constant coordination and feedback are needed. Thus all contingencies that may arise because of changing situations and the fluid nature of the battlefield can be handled.

5-16. UNIT MOVEMENTS AND TRANSPORTATION

a. Requirements.

(1) Aviation brigade units begin training for their combat mission from the time they are activated. The mission may include actively engaging the enemy or providing support. In either case, units deploy to where they can best accomplish their mission. Unit deployment training is necessary if units are to move in the most efficient manner. Whether a unit is deploying from CONUS or 3 kilometers on the battlefield, if it cannot move within its operational requirements, the success of the mission is jeopardized. Frequent training and exercising of unit deployment plans reduce the chances of such an occurrence.

(2) Aviation, unlike other forces, has some self-deploying capabilities. With preparation, some aircraft, personnel, or equipment or a combination of these can self-deploy from CONUS stations to almost anywhere in the world. Aviation forces must plan and train for self-deployment. Because aviation forces can self-deploy, they--in turn--free other transport assets for other missions. Appendix I further describes self-deployment.

(3) Units that plan, train, and validate their movement plans will greatly increase their chances of success. All unit personnel are involved at some phase of a unit movement; key personnel must become knowledgeable of all phases. The more familiar each soldier becomes with the unit's movement plans and operations, the more efficient the movement becomes.

(4) Aviation units often move throughout the battlefield because of the demands of tactical operations. The frequency depends on METT-T; however, they may move as often as twice a day. To conduct movements of supplies, equipment, and personnel, aviation units are equipped with organic wheeled vehicle assets that will expedite aviation operations. These assets will carry equipment required to support, sustain, and survive during deep, close, and rear operations. Units that are operating in their entirety forward of the DSA, even for short periods, require rapid and total unit mobility (100 percent) to survive and sustain combat operations.

(5) Operational aviation units require organic mobility for several reasons. First, mobility is the primary means of avoiding detection and targeting of aviation support assets by Threat acquisition devices. Thus

survivability of vital aviation support assets is increased. Second, mobility reduces dependence on the supporting transportation system. Third, mobility allows assets to be relocated quickly, often over relatively great distances; therefore, adequate and timely support is provided.

(6) Consideration is given to prestocking shipping containers for aircraft components and aircraft covers. This procedure ensures that items are available and precludes delays in deployment of units. The units prepare, load, and off-load aircraft and equipment. Therefore, predeploying ground-handling equipment saves time. Also, understanding the requirement for tool and test equipment at the ports of embarkation and debarkation expedites unit movements.

b. Responsibilities.

(1) Commanders are responsible for the movement of the personnel and equipment of their units. They also--

- Review and validate movement plans, SOPs, and load plans often.
- Supervise the operation of subordinate units.
- Establish policies for air lines and sea lanes of communications operations.
- Coordinate with other headquarters for technical data and logistics support.
- Ensure compliance with directives, policies, and regulations.
- Appoint a unit movements officer.
- Review equipment authorization documents and recommend changes.

(2) Staffs ensure that the commander's directives are carried out. They develop unit movement plans, which include--

- Planning and supervising unit movement training.
- Determining and coordinating logistics support requirements.
- Establishing training programs for unit movement personnel.
- Recommending improvements to the commander.
- Ensuring compliance with directives, policies, and regulations.
- Ensuring that subordinate unit movement plans, load plans, and SOPs are accurate and current.

also-- (3) Unit movement personnel plan and conduct unit moves. They

- Develop unit movement plans, SOPs, and load plans.
- Conduct unit movement training.
- Ensure that proper support and logistics requirements are requested.
- Validate movement plans.
- Inspect and inventory equipment before and after a unit movement.
- Ensure that personnel and equipment are properly prepared before a movement.

c. Planning and Preparation.

(1) Aviation forces must plan and prepare to arrive at designated locations in the area of operations and begin tactical missions at the same time. Modes of movement and deployment are designated in orders. Unit movement orders are delivered in several formats. These orders are provided in an OPORD, a movement order, or a FRAGO. Because of the complexity of unit movements, the movement order is preferred. Movement orders provide detailed information such as transportation support, movement tables, and clearance numbers. The least preferred method is the FRAGO.

(2) The information below will assist planners in preparing directives and SOPs.

(a) The movement directive is the basic document, published by DA, that directs units to prepare to move from home stations in one of the following categories:

- Category A--a move from a home station with all equipment that is authorized to that unit.
- Category B--a move from the home station with minimum essential equipment only.
- Category C--a move from the home station with less than minimum essential equipment. Specific guidance as to what is to be taken will be given in the movement directive.

(b) In an administrative move, enemy contact is not likely. Units are relocated into secure areas and ports of embarkation. The G4 or S4 has staff responsibility for such movements.

(c) A tactical move requires a combat-ready posture and organization during all phases even though the purpose is relocation and not enemy contact. The G3 or S3 has staff responsibility for these operations.

(d) Movement instructions consist of detailed instructions for executing a movement. They are issued as an implementation of the movements program and represent accepted procedures to be followed.

(e) Movement orders are instructions for the movement of personnel and prescribed equipment from one location to another within a stated period of time.

(f) The movement plan is up-to-date logistics data reflecting a summary of transportation requirements, priorities, and limiting factors incident to the movement of one or more units or a special grouping of personnel by highway, marine, rail, or air transportation. FM 101-5 contains an example of a movement plan.

(g) The load plan is a preplanned method for loading personnel and equipment on transport equipment.

d. Self-Deployment.

(1) Because airlift and sealift assets are limited, selected aviation brigade units should plan to self-deploy. Studies and operations have established the feasibility of this option; the extended-range fuel system enables aviation to self-deploy.

(2) The UH-60, AH-64, and CH-47 aircraft are currently scheduled to be provided with the fuel, ALSE, navigation, and communication systems for self-deployment. They will move from CONUS stations to designated departure points for the preparation of the aircraft. Prestationed ground and aerial support and maintenance teams provide stopover point assistance. Self-deployment flights terminate at destination points where ferry equipment is removed and arrangements are made for its return for reuse. Self-deployment applies only to aircraft transferred when other transport assets are not provided; these aircraft may transport a small amount of equipment and personnel.

(3) A command structure must exist to integrate the self-deploying aircraft and crews into the theater of operations. This integration will enhance the availability and effectiveness of these aviation assets in their operational area. Again, Appendix I contains detailed information about self-deployment.

e. Airlift.

(1) Air movement is an operation executed according to prepared plans designed to ensure air transport of supplies, equipment, and personnel. A unit must be able to package, document, load and off-load, and tie down equipment. Air movement is the only military transportation that can respond as rapidly as the situations of the world demand. Air movement of units requires planning by all levels of command. Units are trained not only in mission accomplishment but also in the skilled execution of airlift deployment.

(2) The Military Airlift Command provides the strategic air assets to move personnel and materiel in emergencies or to meet operational requirements. These assets are limited in number and availability. MAC aircraft accept only equipment that is within their space and weight limits. MAC aircraft are spread around the world to support existing requirements. All Army aircraft can be transported in C-141A/B Starlifter or C-5A/B Galaxy aircraft. Table 5-1 depicts an airlift loading chart. Although not addressed in Table 5-1, C-17 aircraft will also be able to transport all Army aircraft (ready-to-fly configured) in the near future.

Table 5-1. Airlift loading chart

C-5 ¹							C-141 ^{1,5}			C-130 ⁵		
MINIMUM DISASSEMBLY				OPTIMUM TRANSPORT ²			OPTIMUM TRANSPORT ²			OPTIMUM TRANSPORT ²		
Type	No	Man-hours	Elapsed time (hours)	No	Man-hours	Elapsed time (hours)	No	Man-hours	Elapsed time (hours)	No	Man-hours	Elapsed time (hours)
CH-47	3	13.5	2.5	3	13.5	2.5	Outsized					
AH-1	12	18.0	3.0	15	24.0	4.0	4	0.5	0.5			
UH-1	8	12.0	2.0	11	18.0	3.0	4	0.5	0.5			
OH-58	12	19.5	3.5	22	33.0	5.5	6	9.0	1.5			
							8	12.0	2.0			
AH-64 ³	6	7.0	1.0	6	7.0	1.0	2	18.0	3.0			
UH-60	6	2.0	0.75	NA			2	5.0	1.5			
OH-58D ⁴	13	27.0	45.0	NA			4	18.0	3.0	2	9.0	1.5

¹Six-member loading crews.

²Number of aircraft that can be transported with further disassembly if flyaway condition is not required on arrival.

³Approximate figures.

⁴Transport on the C-5 does not require removal of the mast-mounted sight (OH-58D).

⁵OH-58D requires Air Transportability Kit for C-141 or C-130.

(3) The unit movement officer is the key to executing the unit's movement and loading plans. He supervises and conducts training and maintains updated movement data. Because operational requirements may exceed airlift capacity, the unit movement officer maintains plans for other types of transportation. FM 55-9 contains detailed information on unit air movement planning.

(4) Specific planning and support requirements for each unit vary. The unit movement officer is aware that in case of a contingency there is only minimum time to plan. To prepare the unit for movement operations, he identifies requirements and routinely develops and validates exercise plans.

f. Rail Movement.

(1) The division or installation transportation officer or DISCOM movement control officer assists movement officers with planning and identifying unit rail loading requirements. He provides information to minimize planning time. He also provides training material and current procedures for transporting equipment.

(2) When available, rail shipment moves heavy and outsized items to the port of embarkation. Because rail shipment can damage sensitive aircraft components, aircraft are flown to those areas for airlift purposes.

(3) The aviation unit is responsible for internal administration and preparation of unit assets for rail movement as with other forms of movement. Plans and SOPs address all rail requirements such as loading, tie-downs, organization, and safety. Rail movement plans are completed as required by the controlling transportation agency.

(4) FM 55-20 assists the unit movement officer in planning and preparing equipment for rail transport. It also provides background information on requirements for foreign countries.

g. Sealift. Only minimum sealift planning and training can be performed. This is due mainly to the many types of merchant vessels. Planning and training are limited to on-site surveys and data on ports of embarkation and debarkation and, to a limited extent, the vessels likely to be employed. The deploying unit will have to prepare accurate cargo loading movement data. Because there are limited planning requirements, higher headquarters should provide guidance and assistance in sealift planning. Particular planning considerations must be considered such as protection for aircraft during sea movement; for example, shrink-wrap.

h. Convoy Movements.

(1) A convoy is always organized for a specific purpose and according to a specific plan. For aviation, it may be a part of an overall plan to relocate before an attack or a movement from the home station to the port of embarkation. A convoy is defined as a group of two or more vehicles organized for control under a single commander. The convoy commander may be the battalion commander or executive officer, a company commander, a platoon leader, or an NCO, depending on the size of the convoy.

(2) Unit moves by convoy require a great deal of time and practice. Much of the time will be used for planning. Movement officers should become familiar with FM 55-30 for assistance in planning unit moves by wheeled vehicles. The manual will assist them in planning and conducting convoys and in determining organizational requirements.

(3) Control of motor movement can be exercised in two ways. It can be exercised by the organization making the movement; or it can be exercised by the commander of an area through which the convoy will proceed.

(4) Organizational control is always exercised during motor movements. The unit SOP addresses many of the control measures. These measures eliminate the need to consider some topics when the movement order is issued. Subjects in the unit SOP include--

- Staff actions.
- Route reconnaissance.
- Convoy commander's briefing.
- Halts.
- Release points.
- Fire support coordination.
- Coordination with other combat forces.
- Messing en route.
- Maintenance en route.
- Refueling en route.
- Medical support en route.
- Convoy organizations.
- Preparation of vehicles and equipment in an NBC environment.
- Vehicle load plan requirements.
- Route selection and clearing.
- Liaison.
- Movement command, control, and communications.
- Advance party procedures.
- Night movement operations.

(5) The planning and coordination involved in a convoy operation require aggressive staff actions. However, a unit SOP can eliminate much of the burden.

i. Training. There are no special training requirements for unit movement personnel. However, personnel designated on orders must sign DD Form 1387-2 (Special Handling Data/Certification) certifying that hazardous cargo is properly prepared for shipment. The Joint Military Packaging Center, Aberdeen Proving Ground, Maryland, instructs in the preparation for transport of hazardous cargo; or one of their mobile training teams provides this training locally. Also, the USAF conducts the MAC airload planner's course, which benefits unit movement officers in planning movements using USAF assets. The Army training catalog, AR 351-1, lists other training. Publications on unit movement, which are not all-inclusive, are listed in the References.

5-17. PERSONNEL SERVICE SUPPORT

Personnel service support is the personnel-oriented CSS function. It affects the personnel replacement operations of units and their missions as well as the morale and welfare of their soldiers. Normally, the unit S1 coordinates personnel services. PSS is divided into critical and essential personnel functions as discussed below.

a. Critical Personnel Functions.

(1) Personnel accounting and strength reporting. Personnel accounting and strength reporting accounts for soldiers and reports their duty status as the foundation for critical battlefield decisions. This function includes operating a C² strength reporting system (both hasty and deliberate) to manage the personnel combat power of the tactical force. The reporting system reconciles deliberate personnel accounting and hasty strength reporting information over time and supports the Army's personnel life-cycle function of sustainment. The brigade S1--

- Receives and consolidates hasty strength information from the battalions.
- Advises the commander on personnel strength matters.
- Compares the results of C²SRS processing against the hasty strength information for each battalion. He identifies obvious discrepancies between hasty and data base information and directs reconciliation, if appropriate.

(2) Replacement operations. Replacement operations encompass the coordination of support and delivery of replacements and return-to-duty soldiers. These operations include orders issuance, personnel accounting, logistics support, processing, and transportation. They also support the Army's personnel life-cycle function of distribution. The brigade S1 ensures that transportation requirements are satisfied for the movement of replacements forward of the BSA.

(3) Casualty management and casualty operations. Casualty operations include records, reports, and accounting for casualties in an expeditious manner. Casualty management coordinates personnel and logistical

processes involved in these operations at all levels. Both casualty management and casualty operations support the Army's personnel life-cycle function of sustainment. The brigade S1 is responsible for the following functions in support of HHD personnel:

- Collecting hasty and written casualty feeder and witness reports.
- Recording duty status changes in the personnel data base.
- Submitting casualty reports to the PSC.
- Managing open cases (for example, missing and evacuated) until final disposition is made.
- Preparing letters of sympathy.
- Accepting and forwarding changes to emergency data information.

(4) Strength management. Strength management assesses personnel combat power, plans for future operations, and assigns replacements on the battlefield. It predicts the need for replacements; it provides a mixture of individuals and small units as replacements to sustain combat power. It also supports the Army's personnel life-cycle function of distribution. The brigade S1--

- Continually collects and correlates critical personnel strength information.
- Advises the commander on the personnel status of the brigade.
- Recommends replacement priorities.
- Provides brigade replacement priorities to the division G1 or AG.

(5) Personnel data base management. Personnel data base management consolidates current and projected personnel information on soldiers and units in a number of command data bases (SIDPERS). These serve as the basis for command decisions and projected battlefield requirements. The brigade S1--

- Receives updates from all battalions.
- Plans for and manages all Continuity of Operations Plans requirements.
- Backs up electronic files.
- Delivers updates to the supporting PSC by way of the G1 or AG (rear area).

(6) Medical services. Medical services are those services performed, provided, or arranged for regardless of location. Medical services promote, improve, conserve, or restore the mental and physical well-being of individuals or groups.

(7) Health service support. The health service support system is divided into four levels. Medical capabilities increase from lower to higher. The treatment capability of higher levels of medical support includes that of all lower levels.

(a) Unit (Level I). Unit health service support includes--

- Preventive medicine activities.
- Acquisition of the sick and wounded.
- First aid.
- Emergency medical treatment.
- Routine outpatient care for ambulatory patients.
- Evacuation from the point of injury or illness to the unit treatment station.

Within the division, most combat battalions have a medical platoon that can run a battalion aid station, provide medics to the companies, and provide some ambulance support.

(b) Division (Level II). Division health service support includes evacuation of patients from unit treatment stations to initial resuscitative treatment in division medical facilities. It also includes tailgate medical support and division medical support on an area basis to units without organic medical personnel. The medical companies of the medical battalion or MSB and FSB set up treatment stations in the BSA and DSA to provide this support. These treatment stations coordinate the care and evacuation of patients. They generally have a physician on hand to perform the surgery necessary to stabilize the patient for evacuation.

(c) Corps (Level III). Corps health service support includes evacuation of patients from supported divisional and nondivisional units, resuscitative and definitive hospital treatment, and area health service support within the corps area. This level of support contains combat support hospitals, mobile army surgical hospitals, and air and ground ambulance detachments and companies.

(d) COMMZ. COMMZ health service support includes the receipt of patients evacuated by USAF resources from the corps areas and the evacuation of patients to, and transfer between, hospitals located in the COMMZ. This support also includes resuscitative, definitive, and restorative hospital treatment and area health service support to troop densities within the COMMZ. General and field hospitals characterize this level of support.

(8) Evacuation. Precision evacuation of the sick and wounded plays a key role in the successful treatment of individuals. Any medical facility may be bypassed when the condition of the patient warrants and evacuation means are available.

(9) Medical supplies (Class VIII). Class VIII is a commodity-oriented system. It follows a more direct distribution path to the user than would otherwise be provided by the general supply system. The management, to include requisition and distribution, is accomplished within the medical system at all echelons.

b. Essential Personnel Functions.

(1) Legal services. Legal services are normally handled by judge advocate general officers within the division. These officers interpret and prosecute war crimes, provide legal defense services, and act as judicial officials for courts-martial.

(2) Chaplain activities. Chaplains are normally assigned to aviation brigades. They provide religious, morale, and counseling services to units and individuals.

(3) Comptroller and finance services. Finance unit commanders are responsible for providing sound financial advice to supported unit commanders and their staffs. A finance support unit will typically support an area assigned to a division, separate brigade, COSCOM, area support group, or equivalent-sized units. Finance support can be provided at the unit location through Class A agents or finance support teams or at the FSU location. The FSU will support the brigade by--

- Paying local procurement requirements.
- Replenishing imprest funds.
- Providing combat payments to soldiers.
- Servicing soldiers' pay accounts.
- Cashing negotiable instruments.

(4) Morale, welfare, and recreation support. MWR gives soldiers' commanders access to and use of morale, welfare, and recreation activities to assist in relief from mission stress, subject to combat intensity. These services include--

- Ration supply sundries.
- Recreational equipment.
- Reading material.
- Motion pictures.

- Live entertainment.
- Retail sales.

(5) Public affairs. This service includes censorship of information for OPSEC reasons. It also includes press releases and newspaper publication to inform military personnel and civilians.

(6) Postal services. Postal operations provide for the management and operation of a postal network to move, deliver, and collect mail in the deployed force, which contributes to the fighting will of soldiers. These operations deliver official mail, to include critical spare parts and medical supplies, and are an alternate delivery system for personnel information. These operations also support the Army's personnel life-cycle function of sustainment.

(7) Administrative services. These services include reproduction, distribution, publication distribution, and classified documents control.

5-18. FIELD SERVICES

Field services are logistics support functions required to support an armed force, excluding supply, maintenance, and transportation. The two categories of field services are discussed below. Normally, the field service capability organic to the division includes clothing exchange and bath; graves registration; and salvage, when augmented. The COSCOM provides the rest of the field service support for the division.

a. Primary Field Services. These services include airdrop and GRREG. Primary field services support combat operations.

(1) Airdrop. The division receives its airdrop support from a quartermaster airdrop supply company normally assigned to the COSCOM. These companies are organic to the airborne and air assault divisions. They are able to rig loads for airdrop and low-altitude parachute extraction system operations by USAF cargo aircraft.

(2) Graves registration. The Army will always take proper care of its dead. This is accomplished through GRREG operations. The unit is responsible for its own search, recovery, evacuation, burial, or transportation or a combination of these operations associated with GRREG until GRREG personnel arrive. Remains are identified and then transported on backhaul of supply vehicles to GRREG collection points in the BSA. These collection points are operated by the supply and service company of the supply and transport battalion or the supply company of the FSB. During peacetime, most divisions have only cadre GRREG personnel available. Upon mobilization and deployment, the divisions are augmented with GRREG sections and platoons from the USAR.

(a) The theater commander establishes one of three policies for GRREG operations. The policies consist of--

- Temporary burial in the theater.
- Permanent burial in the theater (World War II is a historical precedent).
- Return to CONUS (Korea and Vietnam are historical precedents).

(b) Deceased personnel may have to be buried by their fellow soldiers on or near the site of death (for example, NBC-contaminated remains). For hasty burials, the next higher headquarters should be informed of the location of the burial site.

(c) GRREG teams are formed in the units to search for and identify remains and to transport them to GRREG collection points. Team members have a compass for determining azimuths, a map of the search area, paper for sketching the recovery area, entrenching tools, and paper tags with string or wire fasteners for tagging remains. Team members are also issued personal effects bags, human remains pouches (body bags), NBC agent tags, and GRREG forms.

(d) Personnel carry remains feet first at all times. An attitude of reverence and respect is maintained during loading. Remains are loaded on trucks feet first; on fixed-wing aircraft, remains are loaded head first. On helicopters, remains are loaded feet first, if possible. Care is taken that no remains or litter is touching another remains or litter. The vehicle transporting the remains is always covered. Personal effects and identification tags are kept with the remains during evacuation. An escort is sent with the remains during evacuation to provide security against theft and unauthorized entry to the vehicle. This escort should comprise personnel who witnessed the circumstances of the death of the individuals.

b. Secondary Field Services. These services include clothing exchange and bath, laundry and reimpregnation, bread baking, light textile and clothing renovation, and salvage. Secondary field services are not immediately critical to combat operations; deferring them does not materially interrupt combat operations.

APPENDIX A

THEATER AVIATION BATTALION

Theater aviation battalions are organic to aviation brigades at echelons above corps. These battalions are employed throughout the theater area of operations in many diverse roles. However, the theater aviation battalion often operates within the communications zone. Employment of the theater aviation battalion and its subordinate units is based mainly on centralized command and control and decentralized execution. The four variances of the theater aviation battalion are based on TOEs 01605L100, 01605L200, 01605L300, and 01625L000. This appendix describes the mission, organization, C³, employment, CS, and CSS for theater aviation battalions.

A-1. APPLICATION TO AIRLAND BATTLE DOCTRINE

a. Theater aviation battalions are employed throughout the battlefield, particularly in the COMMZ. They greatly enhance the theater commander's ability to execute AirLand Battle doctrine. Theater aviation battalions increase the commander's agility through C³I enhancement operations. These battalions expedite C³ between commanders and their subordinate units, allowing the theater commander to rapidly receive and analyze information. Based on this information, the commander can make quick and sound decisions, which then allow subordinate forces to act faster than the enemy. This agility thus creates opportunities to exercise initiative based on earlier decisions.

b. Synchronization may be the battalion's greatest contribution to AirLand Battle doctrine. Theater aviation assets assist the commander with the integration and synchronization of forces through C³ enhancement, liaison, and augmentation of other aviation forces. Within a theater of operations, the battalion may assist subordinate commanders in seeing the battlefield and enhancing their C² process through liaison so that the theater commander's intent is understood and executed.

A-2. MISSION

The theater aviation battalion provides C² aircraft for air movement of commanders and staff and for liaison. It also performs reconnaissance and surveillance and augments other aviation forces during air assault and air movement operations. The mission and employment roles are further described in paragraph A-6.

A-3. ORGANIZATION

Organic theater aviation battalions have four different organizational structures depending on the theater of assignment. These structures are illustrated in Figures A-1 through A-4.

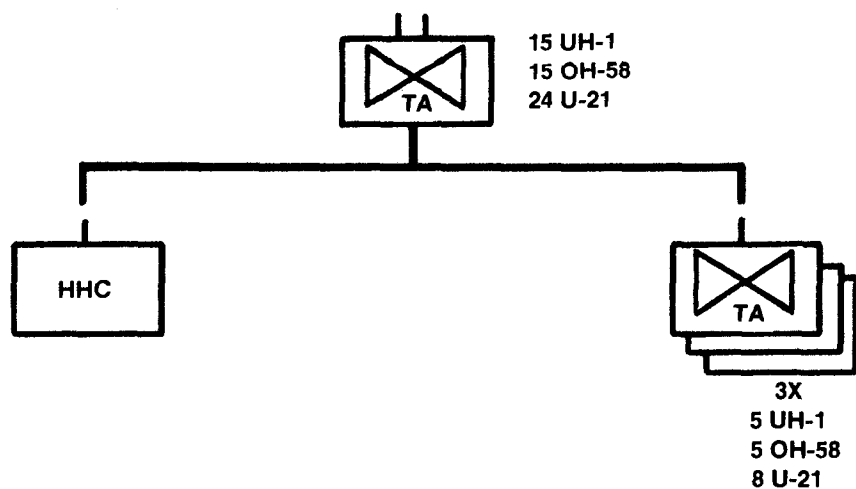


Figure A-1. Theater aviation battalion (TOE 01605L100)

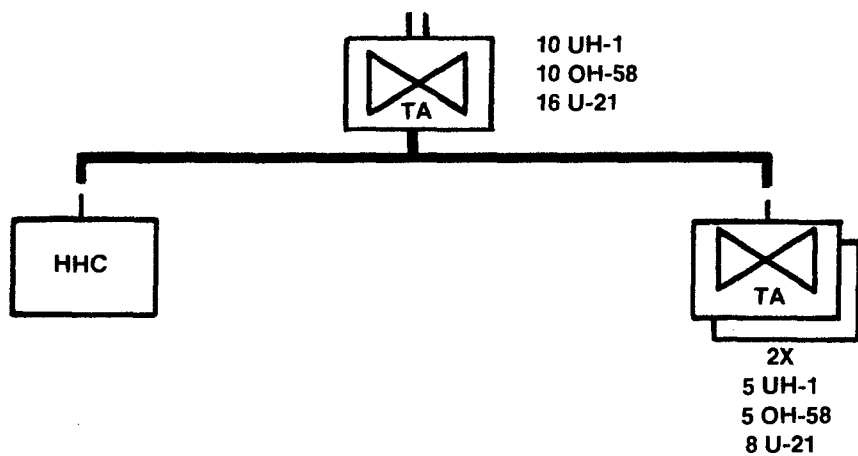


Figure A-2. Theater aviation battalion (TOE 01605L200)

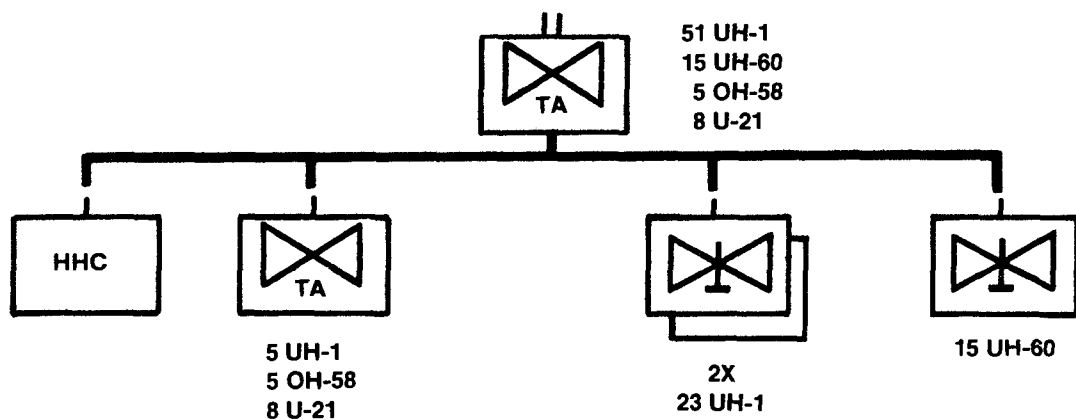


Figure A-3. Theater aviation battalion (TOE 01605L300)

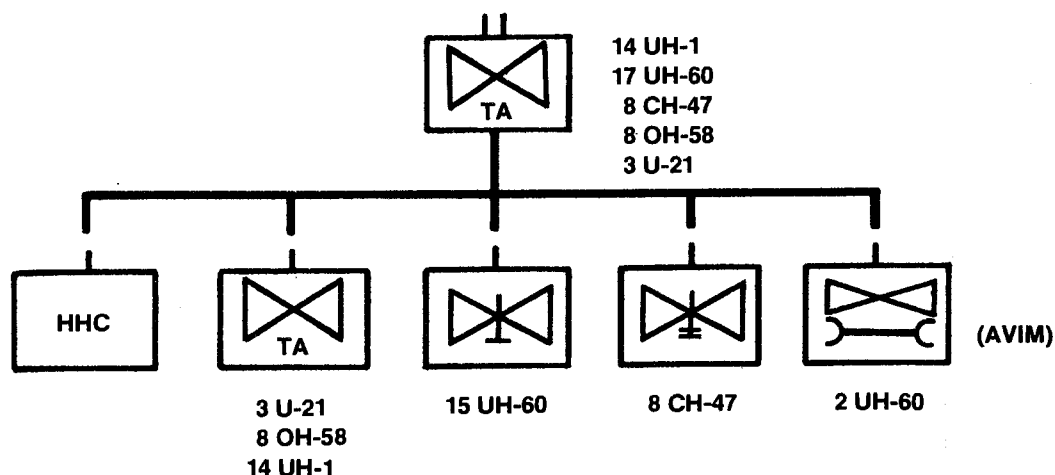


Figure A-4. Theater aviation battalion (TOE 01625L000)

a. Headquarters and Headquarters Company. Each theater aviation battalion has an organic headquarters and headquarters company. All HHCs are about the same, regardless of the theater to which a battalion is assigned. The HHC (Figure A-5) provides command, control, and communications; staff planning; and supervision of operations for the theater aviation battalion. It also provides unit-level automotive maintenance, field and health services, religious support, and supply management for organic units. Each HHC consists of a battalion headquarters section for the battalion commander and his personal staff, the battalion executive officer, and each primary staff section. Within the company headquarters are a supply section, an automotive maintenance section, a mess section, a battalion signal platoon, and a medical treatment squad.

b. Theater Aviation Company. Each theater aviation battalion has from one to three organic theater aviation companies, depending on the assigned headquarters. Theater aviation companies provide command and control aircraft for air movement of commanders and staffs and facilitate liaison operations. They may also augment reconnaissance and surveillance operations; aeromedical evacuation; and air movement of personnel, equipment, and supplies within the COMMZ. The theater aviation company consists of a company headquarters, a Class III section, a flight operations section, a company supply section, an automotive maintenance section, and a company mess section. The theater aviation company also has three to four flight platoons--one to two utility platoons, a C³ observation platoon, and a fixed-wing platoon. An AVUM platoon is also organic to most theater aviation companies. Figure A-6 shows a typical theater aviation company.

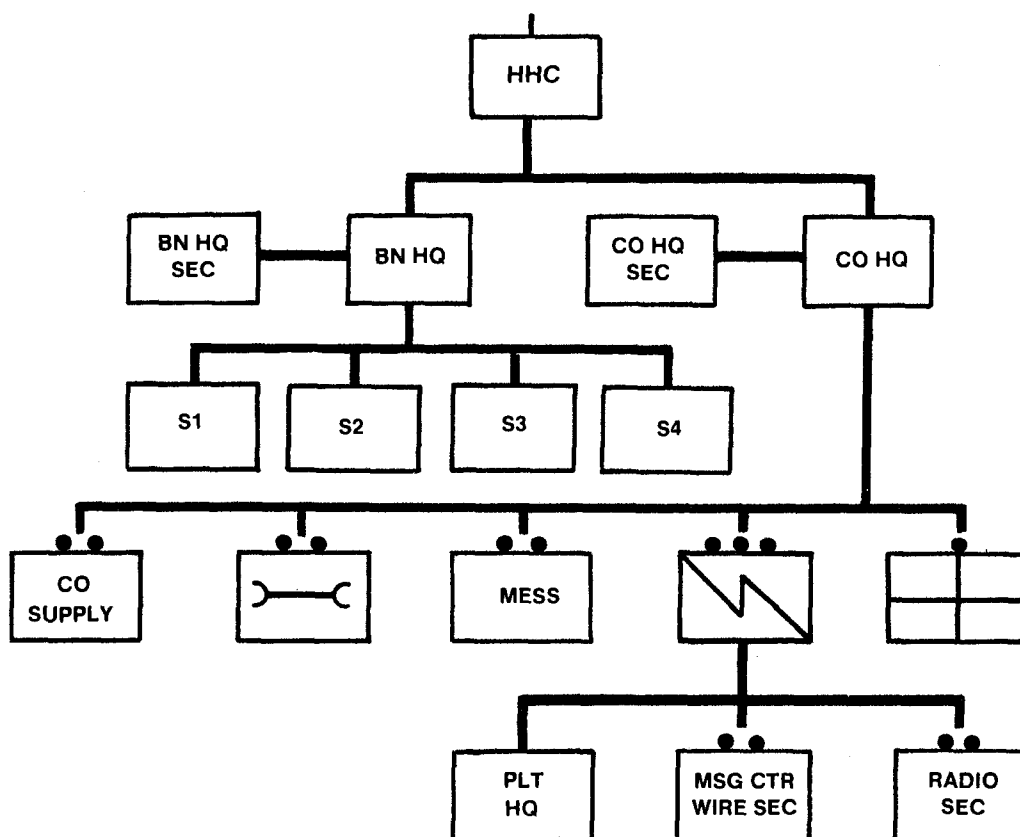


Figure A-5. HHC, theater aviation battalion (TOE 01625L000)

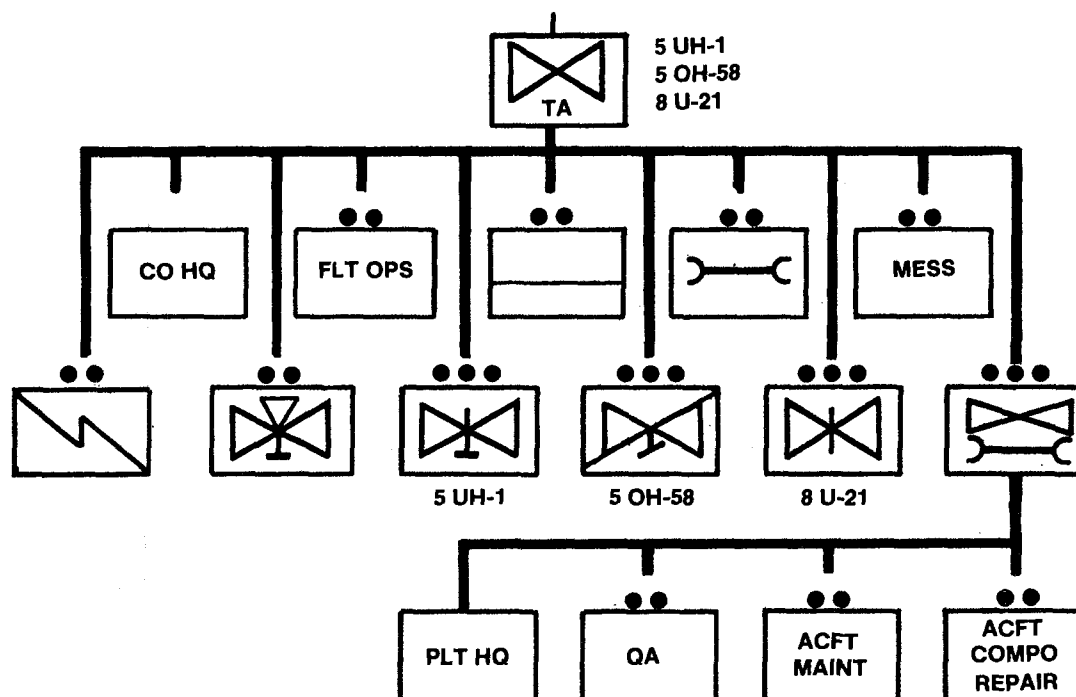


Figure A-6. Theater aviation company, theater aviation battalion (TOE 0625L000)

c. Assault Helicopter Company. The number and type of assault helicopter companies assigned to each theater aviation company vary. The assault helicopter company (Figure A-7) conducts air assault operations in conjunction with ground forces. The company also conducts air movement of personnel, equipment, and supplies. AHCs may augment aeromedical evacuation throughout the battlefield. Assault helicopter companies are equipped with 23 UH-1 or 15 UH-60 aircraft. The AHC is also composed of a company headquarters, a signal section, a flight operations section, a Class III section, a company supply section, an automotive maintenance section, and a food service section. The aircraft of the company are organic to three assault helicopter platoons. The AHC also has an organic AVUM platoon.

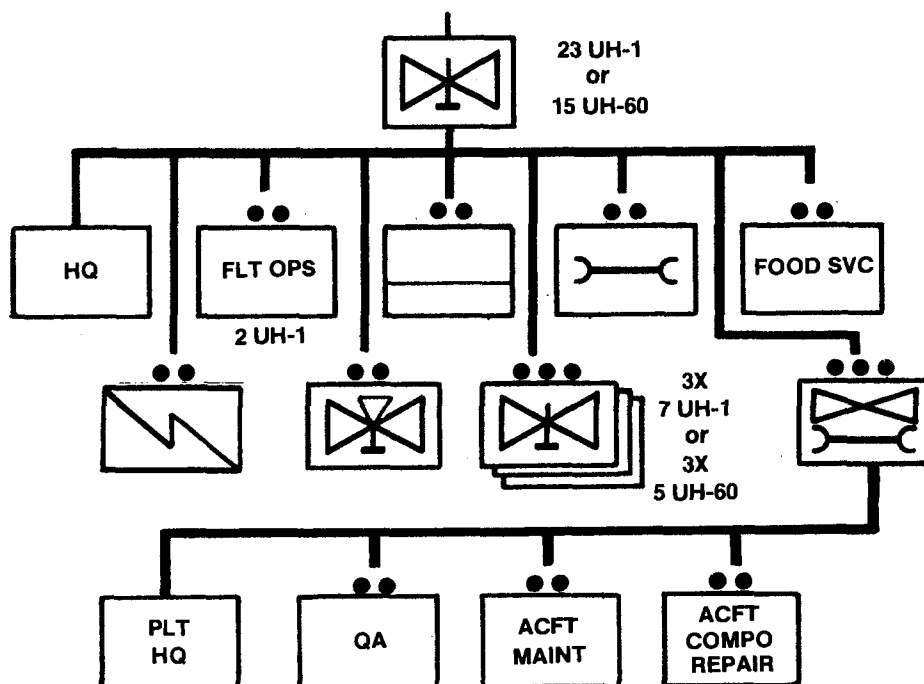


Figure A-7. Assault helicopter company

d. Medium Helicopter Company and Aviation Maintenance Company (AVIM). The theater aviation battalion (TOE 0625L000) has an organic medium helicopter company and an aviation maintenance company (AVIM). The medium helicopter company is composed of a company headquarters, a signal section, a flight operations section, a Class III section, a supply section, an automotive maintenance section, a mess section, two medium helicopter platoons, and an AVUM platoon. The medium helicopter company primarily performs air assault and air movement operations. Figure A-8 shows the organization of a medium helicopter company. The aviation maintenance company (AVIM) is assigned to this battalion to provide readily accessible intermediate support. FM 1-500 further describes the organization and employment of the aviation maintenance company (AVIM).

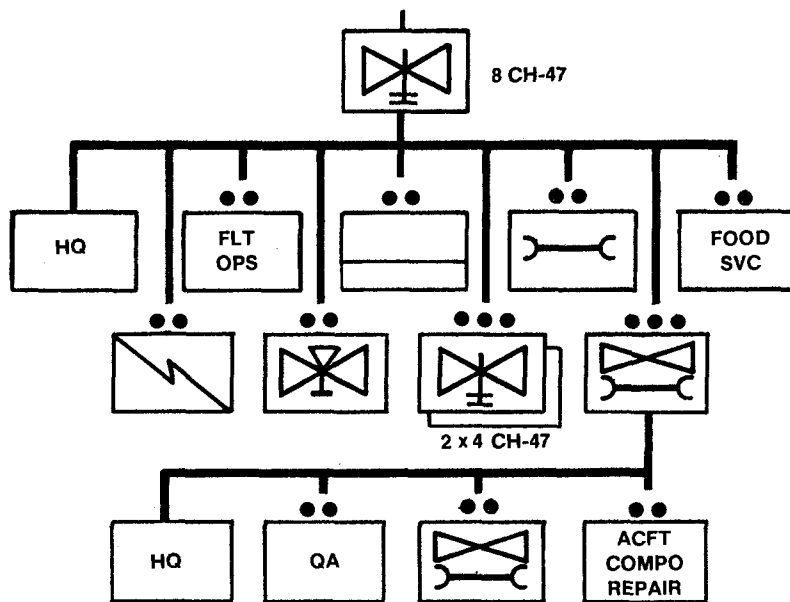


Figure A-8. Medium helicopter company

A-4. CAPABILITIES AND LIMITATIONS

The commander must be aware of the capabilities and limitations of theater aviation battalions. Otherwise, he will not be able to employ these assets to their greatest extent.

a. Capabilities. Theater aviation battalions have several capabilities. They can--

- Enhance C³ for commanders and staff.
- Conduct liaison operations.
- Conduct air assault and air movement operations.
- Augment reconnaissance and surveillance operations to provide timely intelligence throughout the theater, particularly within the COMMZ.
- Augment aeromedical evacuation operations.
- Conduct air combat operations when properly equipped.
- Conduct combined arms, joint, and combined operations.

b. Limitations. Theater aviation battalions have several limitations. They are limited because--

- Weather, obscurations, darkness, and human factors may prohibit or hinder continuous operations.
- Reconnaissance and surveillance assets have a limited capability to operate on wide frontages.

- An NBC environment may severely hamper operations.
- They have a limited ability to secure unit assembly areas and to organically transport all equipment rapidly.

A-5. COMMAND, CONTROL, AND COMMUNICATIONS

The command and control system for the theater aviation battalion is the Army tactical command and control system as described in FM 101-5. The theater aviation battalion uses the C² process, organization, and facilities as other aviation units do. The communications system is also like that of other aviation units. Command and control and support relationships are discussed below.

a. C² Process. The C² process for the theater aviation battalion is directed by the battalion commander and supported by his staff and subordinate commanders. Major functions of this process include analyzing information, formulating estimates, arriving at decisions, and disseminating and supervising orders as described in FM 101-5. Acquiring and assessing this information allow a course of action to be determined. Plans are then developed and directed through the execution phase.

b. C² Organization. C² organization of the theater aviation battalion consists of the battalion commander, his personal staff, the executive officer, and the coordinating staff. The theater aviation battalion does not normally possess much of a special staff. FM 101-5 describes specific duties and responsibilities for the theater aviation battalion commander and staff. However, the theater aviation battalion commander must establish priorities for his subordinate units. He must also clearly delineate their mission and the scheme of maneuver for their employment. The battalion executive officer must integrate and direct those actions of the coordinating staff to meet the commander's intent. The staff must thoroughly plan and coordinate the battalion's operation and support (CS, CSS) so that the subordinate companies have the resources to accomplish the mission. The battalion commander and staff must work closely with the theater army staff, the aviation brigade staff, and the supported commander.

c. C² Facilities. The theater aviation battalion employs those C² facilities normally used by aviation battalions. However, these battalions rarely require a tactical CP. Because of the nature of the mission of the battalion, C² facilities normally include a main TOC, a rear CP, and a battalion field trains. The main TOC focuses on planning and directing operations and integrating CS and CSS for the battalion. The battalion commander and S2 and S3 staff sections are normally positioned at the main TOC. The location of the main TOC depends on METT-T; however, the TOC is positioned where C³ is best facilitated among the battalion, its subordinate units, and higher headquarters such as the aviation brigade. The executive officer will often operate from the main TOC; however, he coordinates closely with the battalion rear CP and trains area. The battalion S1 and S4, under the direction of the battalion executive officer, must ensure that battalion units receive their CSS to sustain operations. The rear CP and trains area may be

collocated with the aviation brigade support area or located close to another support area within the COMMZ. Subordinate theater aviation companies and assault helicopter companies employ C² facilities such as company CPs, assembly areas, and FARPs.

d. C² and Support Relationships. The theater aviation battalion does not normally serve under a headquarters other than the aviation brigade. However, the subordinate companies may often be placed under the operational control of another headquarters for a specific operation. They may also serve in a support relationship, such as direct or general support, for a specified period of time or operation. When subordinate companies are employed by another headquarters, liaison between the company and the higher headquarters is essential. Liaison functions are further addressed in Chapter 2.

e. Communications. The theater aviation battalion is required to maintain communications over great distances with its operational headquarters and subordinate units. The C² facilities must be positioned to meet these requirements. The battalion may rely on other units, such as the aviation brigade or another theater headquarters, to assist by radio relay. The battalion operates a battalion command net, an operations and intelligence net, and an administration and logistics net. The battalion will use signal equipment such as FM(S), UHF, and VHF. Specially equipped aircraft are also necessary for communications for battalion assets in the C³ enhancement role.

A-6. EMPLOYMENT

The theater aviation battalion is employed in several different roles as explained in paragraph A-2. These employment roles include--

- C³I enhancement.
- Reconnaissance and surveillance.
- Air assault operations.
- Air movement operations.
- Aeromedical evacuation.
- Search and rescue.
- Air combat.

a. C³I Enhancement. The primary mission of the theater aviation battalion is to enhance C³I. In this role, subordinate companies will execute their operations in a decentralized manner.

(1) The theater aviation companies employ the aviation platoons to provide C² platforms for air movement or transport of commanders, staffs, and liaison personnel within an area of operations or from one location to another. Normally, commanders and staffs require these C² platforms for

extended periods of time or for a specific operation. Other requirements may include remaining airborne continuously for the operation or a specific time. Continuous operations require extensive relief-on-station operations and critical CSS planning and coordination to meet the needs of commanders and their staffs. These C² platforms must be flexible and responsive to constantly changing situations throughout the battlefield.

(2) Liaison also enhances C³I; theater aviation assets may coordinate with higher, lower, and adjacent units via messenger, face-to-face coordination, or communications operations for the designated headquarters. The C³ observation or utility platoon normally performs C³I enhancement. Communications enhancement operations include radio retransmission or relay conducted by the three aviation platoons within the theater aviation company.

(3) An additional C³ enhancement function is surveillance of the theater lines of communication within the COMMZ. Although the C³ observation platoon is ideal for this role, all aviation platforms in the theater aviation company may be assigned this mission. LOC surveillance may be performed through continuous screening operations or periodic observation. Intelligence and continuous situational reports may be required for designated LOCs. This intelligence must be reported quickly and monitored continuously until further actions are taken based on METT-T. Depending on the command or support relationship, reports may be submitted through the theater aviation battalion TOC or directly to the designated headquarters.

b. Reconnaissance and Surveillance. Theater aviation battalions provide the aviation brigade commander and theater commander and staff with an organic reconnaissance and surveillance capability, primarily within the COMMZ. Theater aviation companies may employ their C³ observation and utility platoons to conduct area, route, and NBC reconnaissance and surveillance operations. These assets perform reconnaissance in rear areas to assist intelligence agencies in developing the IPB. They may reconnoiter future assembly areas for friendly operations and likely enemy avenues of approach and possible LZs. They may also reconnoiter likely MSRs for friendly transportation operations as well as areas suspected of being contaminated with NBC agents. Theater aviation elements perform surveillance or screening operations of LOCs, or they may screen likely enemy avenues of approach previously identified during the IPB. If fire support is available, they may acquire targets and adjust fires, particularly during a rear area incursion. If a rear attack occurs, theater aviation elements maintain surveillance of the area and contact with the enemy and possibly guide reactionary or tactical combat forces.

c. Air Assault Operations. Assault or medium helicopter companies in the theater aviation battalion provide the theater commander with organic aviation assets. These assets perform air assault operations in conjunction with ground forces throughout the theater of operations. Assault and medium helicopter companies in the theater aviation battalion perform air assault operations as described in FM 1-113 and TC 1-115. In this role, these

companies will often participate in air assault operations within the COMMZ; specifically, for example, as part of a tactical combat force formed to counter rear area incursions.

d. Air Movement Operations. Theater aviation battalions perform air movement operations with organic assault or medium helicopter companies and theater aviation companies, using their utility platoons. Air movement includes the transport of personnel, equipment, and supplies. These assets may conduct air movement operations within the COMMZ or forward in the combat zone in support of a subordinate corps. Air movement operations may be conducted by an entire company or a single aircraft; normally, at least two aircraft should be employed. Support relationships are normally used to provide C² for air movement operations. FM 1-113 and TC 1-115 further describe air movement operations.

e. Aeromedical Evacuation. Although it is not their primary mission, theater aviation battalions may augment theater aeromedical evacuation operations. They may be employed to transport patients not requiring special onboard medical equipment while en route from the combat zone to the COMMZ. Theater aviation assets may also augment GRREG unit operations by performing air movement of remains to a designated location within the COMMZ. In this role, theater aviation battalions or subordinate units operate with such units as medical units in the theater or corps support command.

f. Search and Rescue. Theater aviation battalions are ideally suited to perform search and rescue operations. They are normally employed by the aviation brigade commander to perform search and rescue but may accomplish this mission for another headquarters normally within the COMMZ. FM 1-101 explains search and rescue operations in detail.

g. Air Combat Operations. If equipped with air-to-air weapon systems, theater aviation battalions and companies may perform air combat operations in the theater as part of the air defense effort or for self-protection. Air combat operations may be an implied or a specified task as part of the missions previously described in Chapter 3 for the theater aviation battalion. This may be particularly true for C³ enhancement for rear area surveillance and screening operations. Appendix F and FM 1-107 further discuss air combat operations.

A-7. COMBAT SUPPORT AND COMBAT SERVICE SUPPORT

a. Theater aviation battalions operate with fewer combat support assets than other aviation battalions. They may often receive air defense Stinger teams to protect critical C² nodes such as the main TOC, assembly areas, or FARPs. They may also receive IEW, signal, ATS/ATC, weather, and chemical support to conduct missions such as C³I enhancement and reconnaissance and surveillance operations. MP may also be assigned to assist in reaction force operations against a rear area incursion. CS assets for the theater aviation battalion will normally be provided or coordinated through the aviation brigade as described in Chapter 4.

b. Combat service support for theater aviation battalions is also coordinated through the aviation brigade staff and provided by the theater army area support command. The battalion receives its CSS as described in Chapter 5; however, CSS may require some unique planning considerations and coordination. Theater aviation assets often operate away from organic support elements. These assets will require CSS on an area support basis.

APPENDIX B

THEATER DEFENSE AVIATION BATTALION

Theater defense aviation battalions are organic to theater armies. These battalions are employed throughout the theater area of operations in the same manner as theater aviation battalions assigned to aviation brigades at EAC. However, theater defense aviation battalions are employed solely by theater commanders. Although theater defense aviation battalions may operate adjacent to other aviation forces, they are not employed by or with aviation brigades. Employment of the theater aviation battalion and its subordinate units is based mainly on centralized command and control and decentralized execution. This appendix describes the mission, organization, C³ employment, CS, and CSS for theater defense aviation battalions.

B-1. APPLICATION TO AIRLAND BATTLE DOCTRINE

Theater defense aviation battalions greatly enhance the theater commander's ability to execute AirLand Battle doctrine. Execution is carried out in the same manner as with theater aviation battalions, described in Appendix A.

B-2. MISSION

The theater defense aviation battalion provides C² aircraft for air movement of commanders and staff and for liaison. It also performs reconnaissance and surveillance and conducts air assault and air movement operations. The mission and employment roles are further described in paragraph B-6.

B-3. ORGANIZATION

Organizational structures for organic theater defense aviation battalions vary depending on the theater of assignment. This battalion (Figure B-1) has a headquarters and headquarters company, an assault helicopter company, a theater aviation company, a medium helicopter company, and an aviation maintenance company (AVIM).

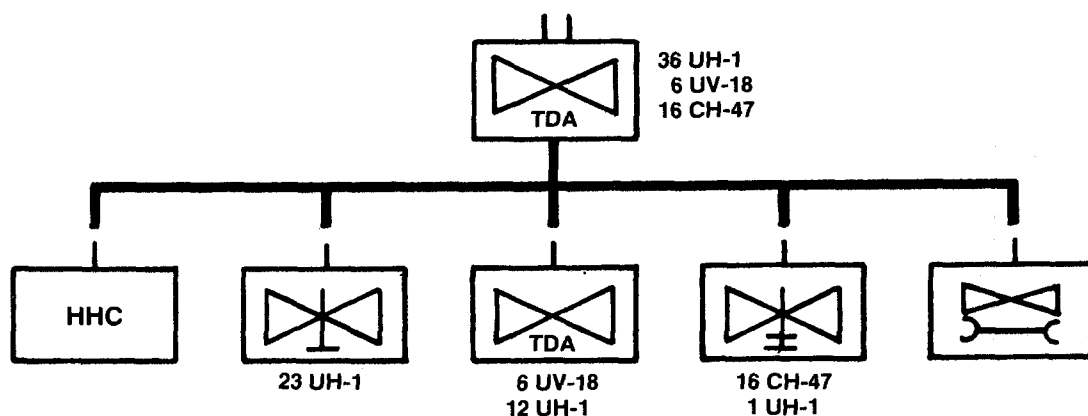


Figure B-1. Theater defense aviation battalion (TOE 0615L100)

a. Headquarters and Headquarters Company. The headquarters and headquarters company (Figure B-2) consists of a battalion headquarters, staff sections (S1, S2, S3, S4), a company headquarters, a supply section, an automotive maintenance section, a food service section, a signal platoon, a medical treatment squad, and a unit ministry team. The HHC provides command, control, and communications; staff planning; and supervision of operations for the theater aviation battalion. It also provides unit-level automotive maintenance, field and health services, religious support, and supply management for organic units.

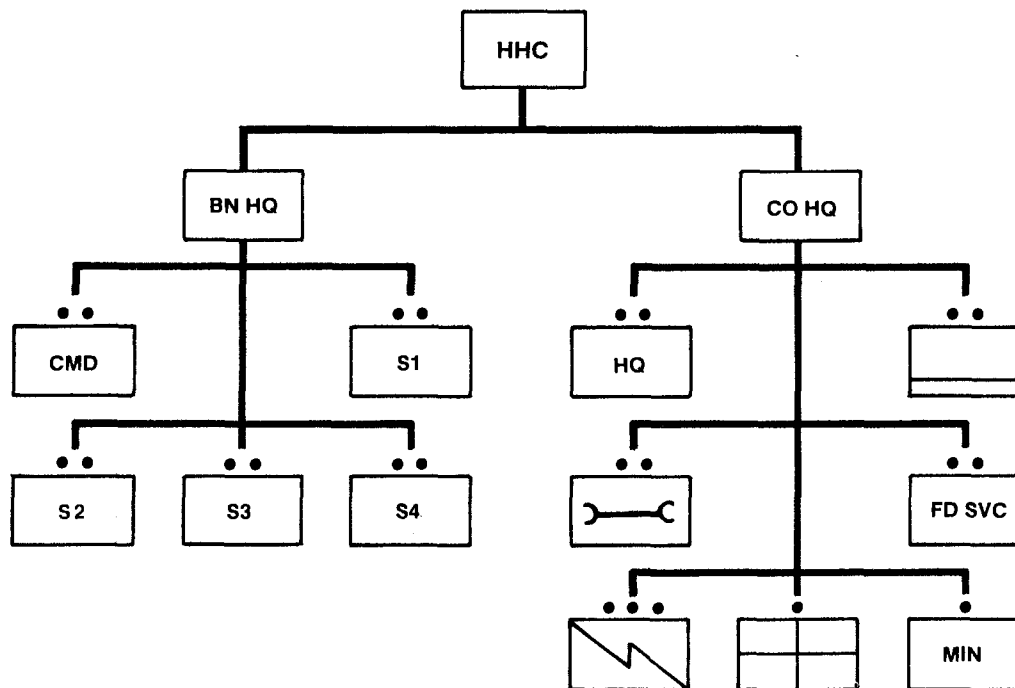


Figure B-2. HHC, theater defense aviation battalion

b. Assault Helicopter Company. The number and type of assault helicopter companies assigned to each theater defense aviation battalion vary. The assault helicopter company (Figure A-7) conducts air assault operations in conjunction with ground forces and conducts air movement of personnel, equipment, and supplies. AHCs may also augment aeromedical evacuation throughout the battlefield. Assault helicopter companies are equipped with 23 UH-1 (Figure B-1) or 15 UH-60. The AHC is also composed of a company headquarters, a signal section, a flight operations section, a Class III section, a company supply section, an automotive maintenance section, and a food service section. The aircraft of the company are organic to three assault helicopter platoons. The AHC also has an organic AVUM platoon.

c. Theater Aviation Company. The theater aviation company in the theater defense aviation battalion performs the same primary missions as other theater aviation companies within the theater aviation battalion. A typical theater aviation company (Figure B-3) in the theater defense aviation battalion consists of a company headquarters, a flight operations section, a supply section, an automotive maintenance section, a food service section, a

signal section, a Class III section, two utility platoons, a medium helicopter platoon, a fixed-wing platoon, and an AVUM platoon. In this example of a theater defense aviation battalion, the theater aviation company may be task-organized, as depicted, to meet specific mission assignments and employment criteria. This particular task organization is tailored to a theater in which reconnaissance and surveillance operations are conducted in an arctic environment.

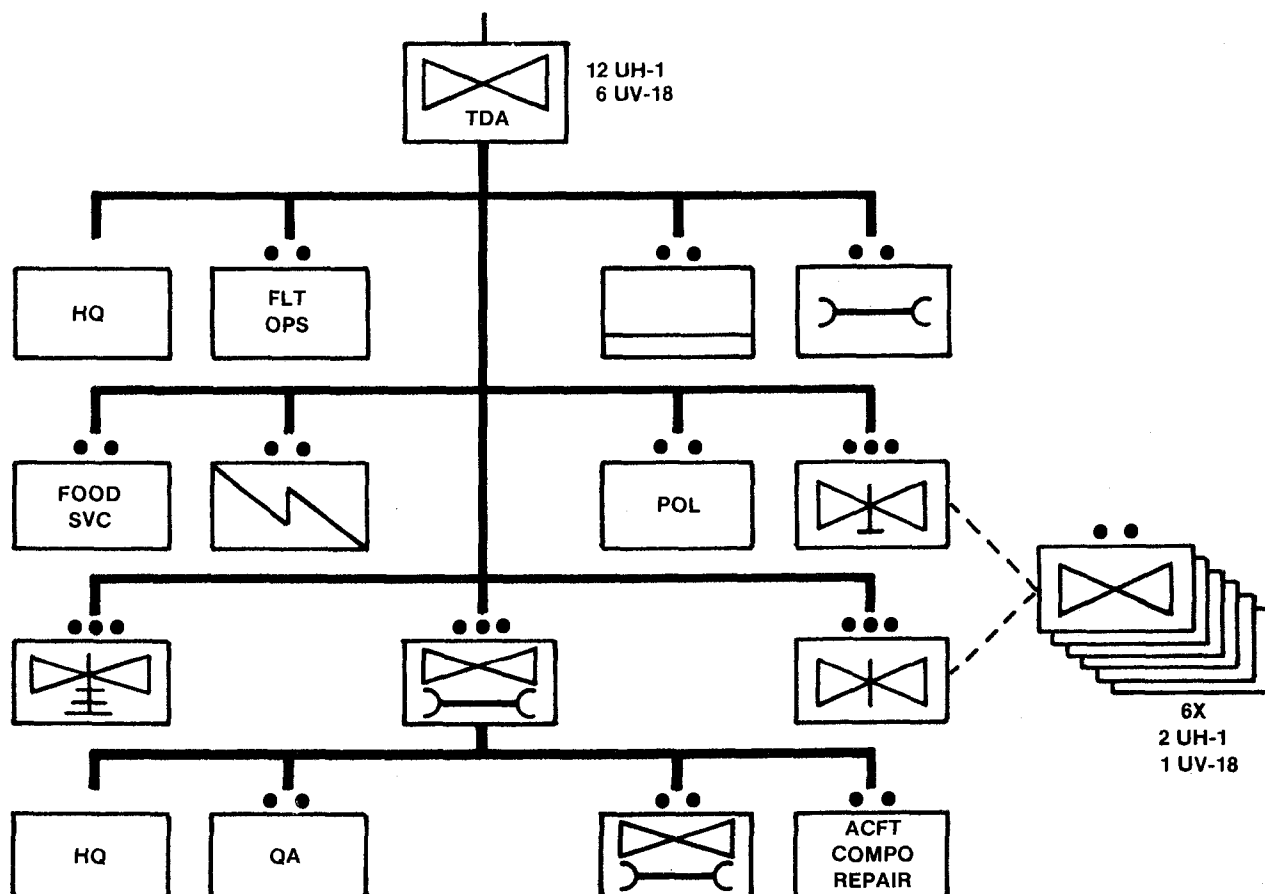


Figure B-3. Theater aviation company, theater defense aviation battalion

d. Medium Helicopter Company and Maintenance Company (AVIM). The medium helicopter company (Figure B-4) is composed of a company headquarters, a Class III section, a signal section, a flight operations section, a unit supply section, an automotive maintenance section, a mess section, an AVUM platoon, and two medium helicopter platoons. The medium helicopter company performs air assault and air movement operations as described in TC 1-115. When assigned to the theater defense aviation battalion, aviation maintenance companies (AVIM) provide intermediate aviation maintenance support. FM 1-500 further describes the organization and employment of these companies.

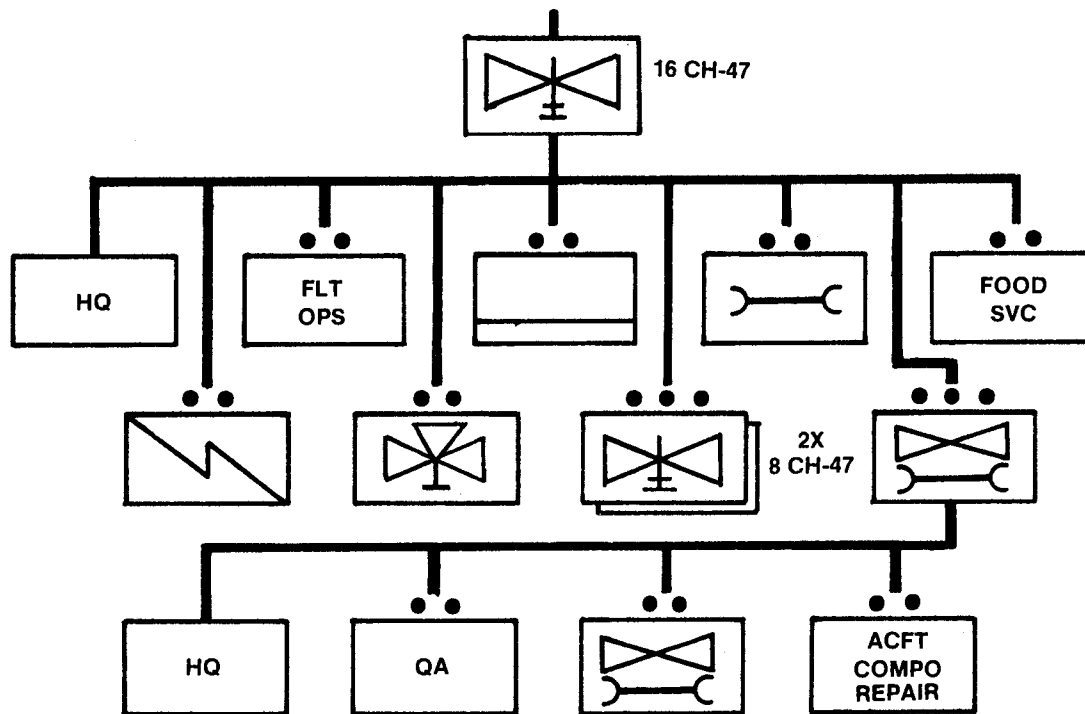


Figure B-4. Medium helicopter company

B-4. CAPABILITIES AND LIMITATIONS

The commander must be aware of the capabilities and limitations of theater defense aviation battalions. Otherwise he will not be able to employ these assets to their greatest extent.

a. Capabilities. The theater defense aviation battalion has several capabilities. This battalion can--

- Enhance C³ for commanders and staff.
- Conduct liaison operations.
- Conduct air assault and air movement operations.
- Conduct reconnaissance and surveillance operations to provide timely intelligence throughout the theater, particularly within the COMMZ.
- Augment aeromedical evacuation operations.
- Conduct air combat operations when properly equipped.
- Conduct combined arms, joint, and combined operations.

b. Limitations. Theater defense aviation battalions have several limitations. They are limited because--

(1) Weather, obscurations, darkness, and human factors may prohibit or hinder continuous operations.

(2) Reconnaissance and surveillance assets have a limited capability to operate on wide frontages.

(3) An NBC environment may severely hamper operations.

(4) They have a limited ability to secure unit assembly areas and to organically transport all equipment rapidly.

B-5. COMMAND, CONTROL, AND COMMUNICATIONS

The command and control system for the theater defense aviation battalion is the Army tactical command and control system as described in FM 101-5. The theater defense aviation battalion uses the C² process, organization, and facilities as other aviation units do. The communication system is also like that of other aviation units. Command and control and support relationships are discussed below.

a. C² Process. The C² process for the theater defense aviation battalion is directed by the battalion commander and supported by his staff and subordinate commanders. Major functions of this process include analyzing information, formulating estimates, arriving at decisions, and disseminating and supervising orders as described in FM 101-5. Acquiring and assessing this information allow a course of action to be determined. Plans are then developed and directed through the execution phase.

b. C² Organization. C² organization of the theater defense aviation battalion consists of the battalion commander, his personal staff, the executive officer, and the coordinating staff. The theater aviation battalion does not normally possess much of a special staff. FM 101-5 describes specific duties and responsibilities for the theater defense aviation battalion commander and staff. However, the theater defense aviation battalion commander must establish priorities for his subordinate units. He must also clearly delineate their mission and the scheme of maneuver for their employment. The battalion executive officer must integrate and direct those actions of the coordinating staff to meet the commander's intent. The staff must thoroughly plan and coordinate the battalion's operation and support (CS, CSS) so that the subordinate companies have the resources to accomplish the mission. The battalion commander and staff must work closely with the theater army staff, the aviation brigade staff, and the supported commander.

c. C² Facilities. The theater defense aviation battalion employs those C² facilities normally used by aviation battalions. Because of the nature of the mission of the battalion, C² facilities normally include a main TOC, a rear CP, and a battalion field trains. The main TOC focuses on planning and directing operations and integrating CS and CSS for the battalion. The battalion commander and S2 and S3 staff sections are normally positioned at the

main TOC. The location of the main TOC depends on METT-T; however, the TOC is positioned where C³ is best facilitated among the battalion, its subordinate units, and higher headquarters. The executive officer will often operate from the main TOC; however, he coordinates closely with the battalion rear CP and trains area. The battalion S1 and S4, under the direction of the battalion executive officer, must ensure that battalion units receive their CSS to sustain operations. The rear CP and trains area may be collocated with the supported ground unit's support area or located close to another support area within the theater area of operations. Subordinate companies also employ C² facilities such as company CPs, assembly areas, and FARPs.

d. C² and Support Relationships. The theater defense aviation battalion and its subordinate companies may often be placed under the OPCON of a theater-level headquarters for a specific operation. They may also serve in a support relationship, such as direct or general support, for a specified period of time or operation. When subordinate companies are employed by another headquarters, liaison between the company and the higher headquarters is essential. Liaison functions are further addressed in Chapter 2.

e. Communications. The theater defense aviation battalion is required to maintain communications over great distances with its operational headquarters and subordinate units. The C² facilities must be positioned to meet these requirements. The battalion may rely on other units, such as the theater headquarters, to assist by radio relay. The battalion operates a battalion command net, an operations and intelligence net, and an administration and logistics net. The battalion will use signal equipment such as FM(S), UHF, and VHF. Specially equipped aircraft are also necessary for communications for battalion assets in the C³ enhancement role.

B-6. EMPLOYMENT

The theater defense aviation battalion is employed in several different roles as previously explained in paragraph B-2. These employment roles include--

- C³I enhancement.
- Reconnaissance and surveillance.
- Air assault operations.
- Air movement operations.
- Aeromedical evacuation.
- Search and rescue.
- Air combat.

a. C³I Enhancement. The primary mission of the theater defense aviation battalion is to enhance C³I. In this role, subordinate companies will execute their operations in a decentralized manner.

(1) The theater aviation companies employ the aviation platoons to provide C² platforms for air movement or transport of commanders, staffs, and liaison personnel within an area of operations or from one location to another. Normally, commanders and staffs require these C² platforms for extended periods of time or for a specific operation. Other requirements may include remaining airborne continuously for the operation or a specified time. Continuous operations require extensive relief-on-station operations and critical CSS planning and coordination to meet the needs of the commanders and their staffs. These C² platforms must be flexible and responsive to constantly changing situations throughout the battlefield.

(2) Liaison also enhances C³I; theater defense aviation assets may coordinate with higher, lower, and adjacent units via messenger, face-to-face coordination, or communications operations for the designated headquarters. The C³I observation or utility platoon normally performs C³I enhancement. Communications enhancement operations include radio retransmission or relay conducted by the theater aviation or assault helicopter company.

(3) An additional C³I enhancement function is surveillance of the theater lines of communication. Although the C³ observation platoon is ideal for this role, all aviation platforms in the theater aviation company may be assigned this mission. LOC surveillance may be performed through continuous screening operations or periodic observation. Intelligence and continuous situational reports may be required for designated LOCs. This intelligence must be reported quickly and monitored continuously until further actions are taken based on METT-T. Depending on the command or support relationship, reports may be submitted through the theater defense aviation battalion TOC or directly to the designated headquarters.

b. Reconnaissance and Surveillance. Theater defense aviation battalions provide the theater commander and staff with an organic reconnaissance and surveillance capability throughout the theater. Theater aviation companies may employ their C³ observation and utility platoons to conduct area, route, and NBC reconnaissance and surveillance operations. These assets perform reconnaissance in the rear areas to assist intelligence agencies in developing the IPB. They may reconnoiter future assembly areas for friendly operations and likely enemy avenues of approach and possible LZs. They may also reconnoiter likely MSRs for friendly transportation operations as well as areas suspected of being contaminated with NBC agents. Theater defense aviation elements perform surveillance or screening operations of LOCs, or they may screen likely enemy avenues of approach identified during the IPB. If fire support is available, they may acquire targets and adjust fires, particularly during a rear area incursion. If a rear attack occurs, theater defense aviation elements maintain surveillance of the area and contact with the enemy and possibly guide reaction or tactical combat forces.

c. Air Assault Operations. Assault and medium helicopter assets in the theater defense aviation battalion provide the theater commander with organic aviation assets. These assets perform air assault operations in conjunction with ground forces throughout the theater of operations. Assault and medium helicopter units in the theater defense aviation battalion perform air assault operations as described in FM 1-113 and TC 1-115.

d. Air Movement Operations. Theater defense aviation battalions perform air movement operations with organic assault and medium helicopter assets. Air movement includes the transport of personnel, equipment, and supplies. These assets may conduct air movement operations within the COMMZ or forward in the combat zone in support of a subordinate corps or theater-level unit. Air movement operations may be conducted by an entire company or a single aircraft; normally, at least two aircraft should be employed. Support relationships normally provide C² for air movement operations. FM 1-113 further describes air movement operations.

e. Aeromedical Evacuation. Although it is not their primary mission, theater defense aviation battalions may augment theater aeromedical evacuation operations. They may be employed to transport patients not requiring special onboard medical equipment while en route from the combat zone to the COMMZ. Theater defense aviation assets may also augment GRREG unit operations by performing air movement of remains to a designated location within the COMMZ. In this role, theater defense aviation battalions or subordinate units operate with such units as medical units in the theater or corps support command.

f. Search and Rescue. Theater defense aviation battalions are ideally suited to perform search and rescue operations. They are normally employed by the theater commander to perform search and rescue but may accomplish this mission for another headquarters within the theater. FM 1-101 explains search and rescue operations in detail.

g. Air Combat Operations. If equipped with air-to-air weapon systems, theater defense aviation battalions and subordinate companies may perform air combat operations in the theater as part of the air defense effort or for self-protection. Air combat operations may be an implied or a specified task as part of the missions described in Chapter 3 for the theater defense aviation battalion. This may be particularly true for C³ enhancement for rear area surveillance and screening operations. Appendix F and FM 1-107 further discuss air combat operations.

B-7. COMBAT SUPPORT AND COMBAT SERVICE SUPPORT

a. Theater defense aviation battalions may operate with fewer combat support assets than other aviation battalions. However, they may be augmented for self-sustainment as depicted in Figure B-1. They may often receive air defense Stinger teams to protect critical C² nodes such as the main TOC, assembly areas, or FARPs. They may also receive IEW, signal, ATS/ATC, weather, and chemical support to conduct missions such as C³I enhancement and reconnaissance and surveillance operations. MP may also be assigned to assist in reaction force operations against a rear area incursion. CS assets for the theater defense aviation battalion will normally be provided or coordinated through the theater staff.

b. Combat service support for theater defense aviation battalions is also coordinated through the theater staff and provided by the theater army area support command. The battalion receives its CSS as described in FM 100-16; however, CSS may require some unique planning considerations and coordination. Theater defense aviation assets often operate away from organic support elements. These assets will require CSS on an area support basis.

APPENDIX C

RISK MANAGEMENT

Tough, realistic training conducted to standard is the cornerstone of Army warfighting skills. An intense training environment stresses both soldiers and equipment, creating a high potential for accidents. The potential for accidents increases as training realism increases. Thus realistic training poses a serious drain on warfighting assets. Commanders must find ways to protect their soldiers and equipment from accidents during realistic training to prepare for war. An accidental loss in war is no different in its effects from a combat loss; the asset is gone. Commanders must compensate for the numerical advantages of the Threat by protecting their combat resources from accidental loss. How well they do this could be the decisive factor in winning or losing. Commanders and staffs can use this appendix as a guide for managing risk as it applies to their organization and mission.

C-1. CONCEPT

Risk management is a tool leaders can use to make smart risk decisions in tactical operations. It allows leaders to execute more realistic training scenarios not otherwise possible because of the high probability of accidents. Risk management is a commonsense way of accomplishing the mission with the least risk possible. It is a method of getting the job done by identifying the areas that present the highest risk and taking action to eliminate, reduce, or control the risk. Risk management thereby becomes a fully integrated part of mission planning and execution.

C-2. RESPONSIBILITIES

Risk management is not complex, technical, or difficult. It is a comparatively simple decision-making process--a way of thinking through a mission to balance mission demands against risks. Once understood, risk management is a way to put more realism into training without paying a price in deaths, injuries, or damaged equipment or all three. Risk management is not limited to training scenarios. It is performed during actual combat as well as in peacetime. Leaders must learn to assess risks during training events and apply the same techniques during combat actions. During combat, risks may be taken but only after they are evaluated and weighed as they are during training.

a. Commanders. As in all other areas, commanders are responsible for the effective management of risk. To meet this responsibility, commanders--

- (1) Seek optimum, not just adequate, performance.
- (2) Select from risk-reduction options provided by the staff.
- (3) Accept or reject residual risk, based on the benefit to be derived.

(4) Train and motivate leaders at all levels to effectively use risk management concepts.

b. Staff. The staff--

(1) Assists the commander in assessing risks and in developing risk-reduction options.

(2) Integrates risk controls in plans and orders.

(3) Eliminates unnecessary safety restrictions that diminish training effectiveness.

c. Troop Leaders. Troop leaders--

(1) Develop a total commitment to mission accomplishment and the welfare of subordinates.

(2) Consistently apply effective risk management concepts and methods to operations they lead.

(3) Report risk issues beyond their control or authority to their superiors for resolution.

C-3. PROCESS

a. Step 1: Analyze Operations. Identify major events of the operational sequence and list them chronologically; then, if necessary, display them in a flow chart. Safety can be built into an operation by first seeing the operation in its entirety. Operations invariably can be broken down into a series of phases, each with special characteristics and considerations. As soon as the commander states the mission and concept, it is usually possible to define the key events. Operations also have a time factor--a beginning-to-ending series of events in which the timing of events is often as significant as the events themselves. The operations analysis is a useful tool in quickly defining the flow and time-sequencing of events in an operation. The objective is to reflect the total operation from the preparatory actions until the soldiers are back in the barracks or the next phase of operations is under way. The operations analysis is a simple but highly effective tool. It ensures that risk is evaluated in every aspect of the operation. Operations safety techniques are effective to a point, but they do not detect risk with the reliability required to achieve the degree of safety needed in today's Army.

b. Step 2: Prioritize Effort. Assess each event, determine whether it is routine, and make an initial risk assessment. Ensure that standards for routine events are adequate to provide an acceptable level of risk. Consider the value of a risk matrix or a decision guide for all or part of the operation. Risk matrices provide a quick and ready method of breaking down an operation into its major operational aspects and eliminating or controlling the risks associated with it. Like other risk assessment tools, risk matrices can be used alone or with other risk analysis techniques to provide

a quick overview of the risk situation. Risk matrices are simple enough to be routinely used by tactical leaders in operational planning. These matrices are nearly always more effective than intuitive methods in identifying the extent of risk. Figure C-1 illustrates a typical matrix that can be used to estimate the level of risk associated with an operation. When using risk matrices, the risk assessor should--

(1) Review each situation to ensure that all significant areas of concern are evaluated, even if they are not included in the matrices.

(2) Use the matrices to analyze the risk to target areas of concern for risk-reducing action.

(3) Review the individual areas of concern before recommending an option. (If an area of concern is off the scale in a particular situation, a higher decision level may be required than the risk gauge suggests.)

c. Step 3: Conduct Preliminary Hazard Analysis. Focus on high-hazard events and events not covered by a good set of standards. Complete a preliminary hazard analysis of these events. The preliminary hazard analysis is the initial examination of the hazards of an operation and their implications. It is normally based on the mission analysis and data-base review and takes place before the details of an operation have been completely defined. The objective of the preliminary hazard analysis is to define, at the earliest possible point in the operational life cycle, the hazards that can be expected. Doing this early means that these hazards can be addressed when they are still preliminary; that is, when the operation is still being planned. Thus hazard controls can be evaluated as the operation evolves rather than tacked on later, often as an afterthought.

d. Step 4: Use Analytical Aids. Based on the preliminary hazard analysis, complete logic diagrams or similar analytical aids for key sources of risk. Consider using the Army safety data base. Use logic tools. Logic tools, such as logic trees, are the basic tool of hazard identification. There are many variations of logic trees, but all are either deductive or inductive. Deductive logic starts from an end point and determines how an event may have occurred. Inductive logic takes an immediate event, such as a part failure or human error, and determines what result it may produce. Logic trees impose a logical step-by-step discipline to the detection of hazards. They have been proven to consistently outperform intuitive hazard detection procedures by considerable margins. In concept, these diagrams are identical to those nearly everyone has used at one time or another.

(1) Once the major aspects of the operation have been defined through mission analysis, the next step is to determine accident patterns in similar past operations. Unless an operation is especially unusual, it has been performed many times before somewhere in the Army. The smart commander planning an operation that goes beyond the everyday routine will want to know the accident history for the type of operation and how the accident happened. After all, it is unquestionably better to learn of hazards through someone else's mistakes than by personal experience.

RISK ASSESSMENT WORK SHEET OPERATION

Side A

Planning

CIRCLE ONE	Risk Value			SCORE
Guidance	Preparatory Time			Minimal
	Optimum	Adequate		
FRAGO	3	4		5
OPORD	2	3		4
OPLAN/LOI	1	2		3

Mission Control

CIRCLE ONE	Risk Value			SCORE
Task Organization	Training Event			Night Tactical
	Support Nontactical/Garrison	Day Tactical		
OPCON	3	4		5
Attached	2	3		4
Organic	1	2		3

Soldier Endurance

CIRCLE ONE	Risk Value			SCORE
Environmental Preparation	Soldier Preparation			Minimal
	Optimum	Adequate		
Nonacclimated	3	4		5
Partially Acclimated	2	3		4
Acclimated	1	2		3

Soldier Selection

CIRCLE ONE	Risk Value			SCORE
Task	Soldier Experience			Untrained
	Highly Qualified	MOS Qualified		
Complex	3	4		5
Routine	2	3		4
Simple	1	2		3

Side A Subtotal

Side B

Weather

CIRCLE ONE	Risk Value			SCORE
Temperature (°F)	Visibility/Moisture			Rain/Snow/Ice/Dust
	Clear/Dry	Fog/Humid/Drizzle		
<31° or >80°	3	4		5
32°-59°	2	3		5
60°-79°	1	2		5

Terrain

CIRCLE ONE	Risk Value			SCORE
Type of Terrain	Trafficability			Trail/Cross Country
	Improved	Secondary		
Mountain	3	4		5
Desert/Jungle Hills	2	3		4
Flat/Rolling	1	2		3

Sustainability

CIRCLE ONE	Risk Value			SCORE
Percentage of Personnel Fill	Type of System			Crew Served
	Wheeled	Track		
0-65%	4	5		5
66-79%	2	4		4
80-100%	1	2		2

Subtotal Side B Subtotal Side A Total

0 to 12 Low Risk	13 to 23 Caution	24 to 35 High Risk *
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*High-risk operations assigned a value of 24-35 require coordination, before executing the mission, with the next higher level of command external to the organization making the assessment. When two or more areas are assigned a risk factor of 5, the overall rating is high risk.

Figure C-1. Suggested format for a risk assessment work sheet

(2) Many Army installations now have a direct computer tie-in to the Army safety management data base located at the US Army Safety Center, Fort Rucker, Alabama. The terminal for this tie-in is normally located in the installation safety office, which also has experts trained in data recovery procedures. The data base has records of all significant Army accidents since 1974. Information can be recovered in a variety of formats. For example, data pertaining to a piece of equipment Armywide, a particular unit, or a particular operational activity can be printed out. The possibilities are nearly endless. This data can be used in equally varied ways. For example, operators of particular pieces of equipment could be given summaries of recent accidents involving the kind of equipment they operate. Leaders at various levels could be given summaries of accidents involving their types of units in a particular type of operation. The data base can provide objective data regarding the frequency and severity of accidents in past operations.

e. Step 5: Develop Risk-Control Options. Based on the preliminary risk analysis and products of analytical aids, develop a roster of options for eliminating or controlling the risks. Select or offer options for command decision. Once risks are identified and measured as accurately as possible, the leader must act to eliminate or control them. These controls must not unnecessarily interfere with training objectives. The best options often come from reviewing the doctrinal publications relevant to the operation to glean information about the proper procedures for hazard control. Merely reviewing the analysis and assessment will often suggest options. Some options will be more effective than others. AR 385-10 provides a convenient list of actions that commanders can use as an aid in ranking options. In order of priority, commanders should--

(1) Eliminate the hazard totally, if possible. Engineer out the hazard, design equipment to eliminate the hazard, or incorporate fail-safe devices.

(2) Guard or control the hazard. Use automatic monitoring or alarming devices. Provide containment or barriers.

(3) Change operational procedures to limit exposure. Modify operational procedures to minimize exposure (numbers and duration) consistent with mission needs.

(4) Train and educate personnel in hazard recognition and avoidance.

(5) Provide protective clothing or equipment that will minimize injury and damage potential.

(6) Use color coding and signs to alert personnel to hazards. Motivate personnel to use hazard avoidance actions. Leaders can detect and eliminate unnecessary safety restrictions that impede the realism or effectiveness of training. With proper controls, these restrictions can be eliminated or scaled back. Check for residual effects before implementing risk-reduction options. Visualize what will happen once the option has been implemented. Sometimes reducing one risk will only introduce others.

f. Step 6: Routinize Risk-Control Procedures. Put effective risk control options in SOPs to routinize them as standards and ensure their availability in the future.

g. Step 7: Evaluate Results. Determine the effectiveness of standards in controlling risk. The commander may have approved a number of risk-reduction procedures, but approval does not mean that the procedures are carried out. Leaders must monitor the situation to ensure that action is actually taken. The prudent leader then follows up to see that the doers understand and accept the guidance. Leaders should also monitor the effect of risk-reduction procedures to verify that they really are good ideas. Monitoring is needed especially for new and untested procedures.

(1) Leaders must always monitor the operational activities of subordinate elements. Leaders can fully appreciate risk implications only by seeing the character of operations. When monitoring operational activities, leaders should--

- Avoid administrative intrusions and not get in the way.
- Go where the risks are and spend time at the heart of the action.
- Analyze and think through issues, not just watch.
- Work with key personnel to improve operational procedures after the action and not hesitate to address imminent danger issues on the spot.
- Fix systemic problems that are hindering field effectiveness.

(2) Leaders must be able to balance the cost of the risk involved with the value of the desired outcome in an operation. They must consider and manage risk in making decisions. Three general rules apply when leaders select a tactical procedure. They are--

(a) No unnecessary risk should ever be accepted. The leader who has the authority to accept a risk has the responsibility to protect his soldiers from unnecessary risk. If a risk can be eliminated or reduced and the mission still be accomplished, the risk is unnecessary and must not be accepted.

(b) Risk decisions must be made at the appropriate level. The leader who will answer for an accident is the person who should make the decision to accept or reject the risk. In some cases, this leader will be a senior officer. In other cases, the first-line leader will make these decisions. Small-unit commanders and first-line leaders are going to make risk decisions in combat. Therefore, they should learn to make risk decisions in training.

(c) The benefits of taking a risk must outweigh the possible cost of the risk. Leaders must understand the risk involved and have a clear picture of the benefits to be gained from taking the calculated risk.

APPENDIX D

LOW-INTENSITY CONFLICT

Low-intensity conflict is a political-military confrontation between contending states or groups below conventional war and above the routine, peaceful competition among states. It often involves protracted struggles of competing principles and ideologies. LIC ranges from subversion to the use of armed force. It is waged by a combination of means employing political, economic, informational, and military instruments. Low-intensity conflicts are often localized, generally in the Third World, but contain regional and global security implications. This appendix is an overview of LIC. It covers aviation's roles as well as some unique planning considerations and employment techniques for aviation brigades and subordinate units.

D-1. THE ENVIRONMENT

Throughout their history, particularly since World War II, US Armed Forces have been assigned to assist other agencies of the US Government and friendly foreign governments and groups in low-intensity conflict. This assistance ranges from advice, training, and transfer of material to participation in armed combat. The circumstances include international wars as well as insurgencies within a single country. The US role may include operations in any of the four operational categories of low-intensity conflict: support to insurgency/counterinsurgency, peacekeeping operations, combating terrorism, and peacetime contingency operations.

a. To be effective in this environment, aviation brigade commanders and staff must understand the nature of the conflict and US goals and methods. They must understand that the objective in low-intensity conflict is to solve the problem by political, economic, and informational means, with support from the military. Thus the military role is indirect and supportive. Doctrine, tactics, techniques, and procedures for military operations must be modified to fit the situation.

b. Low-intensity conflict challenges US national interests. A strategic consequence of unfavorable outcomes in the low-intensity conflict environment could be the isolation of the United States from its allies and global trading partners. This isolation would weaken the political and economic institutions of the free world.

c. Low-intensity conflict arises from a variety of contemporary factors. Around the world, people demand change. However, they are dissatisfied with the rate of change, the way it is managed, and the dislocations it creates. Progress for one person creates problems for another. It upsets traditional ways of doing things and causes resentment. When groups of people sense that societal conditions are harming them and that those conditions are caused by or could be relieved by the government, they may organize into forces employing violence to achieve their goals. The same factors contribute to conflict between states. United States policy is to assist peoples and their governments in managing change in an orderly and peaceful manner.

d. Drug trafficking is a criminal activity motivated by money. When drug lords become so rich and powerful that they develop a paramilitary capability for violence and challenge the authority of governments, their activities become part of low-intensity conflict. The drug trade destroys the lives of US citizens and undermines friendly governments and US international interests.

D-2. ARMY AVIATION'S ROLE

a. The US Armed Forces assist countries in the Third World by providing training, equipment, advice, and services. The United States may also commit its forces to combat operations in exceptional circumstances when the national command authorities direct. National policy and the nature of the conflict require that the Army operate in support of friendly foreign forces and other agencies of the US Government. Hence, aviation forces are usually part of the joint, combined, and interagency operations. Aviation has an active role in many current low-intensity conflicts throughout the world. LIC missions require both combatant and noncombatant forces. Army aviation's operations in Central and South American conflicts have demonstrated aviation's vital role in military operations in low-intensity conflicts as have operations in the Persian Gulf.

b. Army aviation may be the commander's best reconnaissance and surveillance capability, greatest firepower asset, and greatest source of mobility. In LIC operations, aviation forces conduct reconnaissance and security, air assault, and air movement of personnel, supplies, and equipment. US Army forces committed to operations in low-intensity conflict are task-organized to accomplish their mission. The aviation brigade commander could find himself as the task force commander, responsible for a mix of aviation and other units; or he could be called on to provide elements of his command to other task-organized forces.

D-3. OPERATIONAL CATEGORIES

The US Armed Forces engage in four major categories of operations in the low-intensity conflict environment: support for insurgency/counterinsurgency, combating terrorism, peacekeeping, and peacetime contingency operations. These general categories are not mutually exclusive and often overlap. For example, peacekeeping forces should take antiterrorism precautions to protect the force, and a peacetime contingency operation may be executed to support an ally experiencing insurgency. The following paragraphs give examples of the roles and involvement of Army aviation in such operations.

a. Support for Insurgency/Counterinsurgency. Army aviation has great potential for providing support to an insurgency or for a friendly nation's counterinsurgency efforts. The outcome of such a conflict is determined by the ability of one side or the other to enhance its legitimacy among the people. The aviation brigade commander must keep in mind that the threat consists of the societal conditions that motivate the conflict as well as the insurgent forces that fight it. Success depends more on alleviating these conditions than on destroying the insurgent combat forces. Without

motivation, the insurgent forces will not exist. Thus the side that seems better able to solve the people's problems is the likely winner. This is the theory behind the Internal Defense and Development strategy. (See FM 100-20.)

(1) The danger of death or injury to noncombatants and destruction of their property put serious limits on the offensive use of aviation in insurgency/counterinsurgency. Collateral damage of this type undermines the legitimacy of the side supported by the United States and is counter-productive. While offensive operations may be used, they must be carefully controlled. The better course is usually to find a more discrete delivery system or to refrain from attacking altogether.

(2) Victory in an insurgency comes from balanced political, economic, and social development. In these efforts, the role of Army Aviation--like that of the Armed Forces generally--is indirect and supporting. Army aviation can and should be used in support of other agencies of the US and foreign governments or supported groups. It can provide transportation for agricultural and other development teams of the Agency for International Development. Aviation can fly civilian MEDEVAC missions. Aerial reconnaissance can collect important economic data. Air traffic services may be almost nonexistent in Third World countries; their provision by Army aviation elements can be invaluable. The possibilities are limited only by the imagination. This is what the LIC imperative of "adaptability" means.

(3) In those exceptional circumstances when US forces may be directly involved in combat operations, the mobility and firepower of aviation help solve the dilemma of protecting all the targets that the insurgent may choose to attack. Its rapid reaction capability permits the distribution of ground forces in widely separated small groups. Aviation can provide the necessary reaction force to defend such groups should they be attacked.

b. Peacekeeping Operations. Peacekeeping is the interposition of neutral forces between former belligerent parties with their consent to help resolve the conflict by diplomatic means. Army aviation gives reconnaissance, surveillance, air movement, and logistical support to peacekeeping operations. Aviation's role in C³ enhancement increases the commander's ability to observe operations directly, provides radio relay support, and provides transportation for courier service. Aviation can perform emergency medical evacuation of observers from remote sites. The rapid mobility of Army aviation enables peacekeepers to intervene quickly in a potential crisis to solve a dispute before it derails the diplomatic process. All of these functions have proved their worth in peacekeeping operations by the Sinai Multinational Force of Observers. Although peacekeepers employ violence only in self-defense, aviation mobility also enhances the ability of the force to deploy rapid reaction units should the need arise.

c. Combating Terrorism Operations. Terrorism is a tactic that can be employed by an enemy in any level of the operational continuum. It consists of violence for psychological purposes. The target may be any person, unit, or installation. Terrorism is intended to control the behavior of someone other than the victim. All Army organizations are responsible for

antiterrorism, which consists of measures to protect the force from attack. Army aviation is a highly visible, symbolic target. Its personnel and equipment are subject to attack on the ground and in the air by small arms, automatic weapons, and hand-held air defense missiles. As with other low-intensity conflicts, the Armed Forces support other agencies of government in combating terrorism. In the United States and its territories, the lead agency is the Federal Bureau of Investigation. The Federal Aviation Agency deals with terrorist acts directed against aircraft in flight. Overseas, the Department of State has the lead. Military participation in combating terrorism is executed in support of and in coordination with those agencies. Aviation's primary role in combating terrorism operations lies in protecting its personnel, units, and facilities from terrorist acts. Intelligence, active and passive security measures, and individual awareness are essential to combating terrorism. Aviation combats terrorism operations through IPB, reconnaissance, and surveillance. Aviation's involvement in offensive counterterrorism operations is generally in support of special operations forces.

d. Peacetime Contingency Operations. This category includes a variety of situations and actions, some of which are warlike while others are benign. All of them support political initiatives; violence is to be avoided or minimized. Among the operations in this category are--

- ° Disaster relief operations.
- ° Security assistance surges.
- ° Support for US civil authority.
- ° Noncombatant evacuation operations.
- ° Rescue and recovery operations.
- ° Peacemaking operations.
- ° Shows of force and demonstrations.
- ° Unconventional warfare.
- ° Strikes and raids.

(1) In disaster relief operations, security assistance surges, and unopposed rescue and recovery and noncombatant evacuation operations, aviation is used in the indirect role. It can provide important C³, transportation, and logistics capabilities for US efforts.

(2) Army aviation plays an important role in US support to friendly governments' efforts to eliminate drug trafficking. It supports the Drug Enforcement Administration, the Department of State, and other agencies with airlift, reconnaissance, and surveillance. It can--when directed by competent authority--conduct direct combat operations to destroy drug-processing plants and drug traffickers' lines of communication.

(3) In demonstrations and shows of force and opposed rescue and recovery and noncombatant evacuation operations, aviation is a critical force multiplier. Use of aviation in support of peacetime contingency operations will vary depending on the threat and the mission. The aviation brigade can deploy rapidly with any combination of forces--to command and control, to gather intelligence, to provide firepower, and to coordinate ground actions. Aviation units, along with light forces, have a vital role in such peacetime contingency operations. These represent the most direct use of military force in low-intensity conflicts.

D-4. MISSION, ENEMY, TERRAIN, TROOPS, AND TIME AVAILABLE

In LIC, the factors of METT-T are complemented by consideration of the following low-intensity conflict imperatives:

- Political dominance.
- Unity of action.
- Adaptability.
- Legitimacy.
- Perseverance.

a. Mission. The mission is to support the political, economic, and informational instruments of power. That mission has great implications for command and control. Some other agency of the US Government will have the lead. Usually that agency is the Department of State. The US ambassador has authority over all agencies of the US Government in the country to which he is accredited except military forces in the field operating under a unified Commander in Chief. The ambassador exercises his authority through the country team. That is an executive committee consisting of the senior representative of each government agency present in the country. The military mission must be accomplished within the context of the overall national aim. This constraint affects how operations are conducted. To the brigade commander, political dominance may be observed most clearly in restrictive rules of engagement.

b. Enemy. The enemy is difficult to identify. Even those forces clearly opposed to the United States mix with the population and may not be recognized until they have committed a hostile act. There may be only a potential enemy. For example, the armed forces of a nation on whose territory a rescue or recovery mission is executed may or may not oppose the operation. US actions must encourage them not to intervene. At the same time, US forces must deal effectively with intervention should it occur. Intelligence must identify not only capabilities but also intentions.

c. Terrain. The psychological "terrain" is as important as the physical setting. The US purpose is to influence attitudes and actions with minimum use of force. Also, the brigade commander and his intelligence staff must

keep in mind that physical features may have different significance in low-intensity conflict operations than in a more conventional situation. Terrain that appears impassable and inhospitable may be the best avenue of approach for an enemy force or the location of a base area. This terrain must be the object of reconnaissance and surveillance. The enemy is likely to operate most effectively when flying conditions are at their worst.

d. Troops. The special situation of low-intensity conflict requires that troops exercise great restraint under extreme provocation. Commanders must make troops understand the reasons for restrictions imposed on them. Commanders must also exercise influence over people not directly under their command such as host nation forces and civilian agencies of the US Government. They do this by persuasion through the force of their personalities and the logic of their arguments. The physical environment of the Third World may impose special burdens on US troops such as temperature extremes, mountains, deserts, and jungles and remoteness from familiar surroundings and support services. Commanders must also be prepared to deal with boredom when active operations may be infrequent.

e. Time Available. Conventional wartime operations require intense levels of activity in short periods of time. This activity may occur in LIC as well. However, there also may be extended periods of relative inactivity and circumstances when action is better postponed. The LIC imperative of perseverance applies. It has two parts. First is the requirement that the United States and its forces be prepared to stay the course, understanding that the often complex situations of the LIC environment cannot be solved quickly. The other is that sometimes the better course of action is to do nothing. An example of the latter is an opportunity to destroy an enemy force that would possibly also cause friendly or neutral casualties or property damage. In those cases, it may be better to sacrifice short-term success for long-term goals.

D-5. DEPLOYMENT OF AVIATION FORCES

a. The first US military response to a low-intensity conflict will probably be the provision of security assistance. This assistance will consist of material, training, and advice. Provision of services by US Army personnel and units would follow, if required. This sequence is dictated by US national policy and the nature of low-intensity conflict. Combat operations by US forces are not the preferred option; however, US policy does not preclude their employment under exceptional circumstances when other indirect actions have failed to achieve US objectives. In this case, Special Operations Forces and air assault, airborne, and light infantry divisions are the forces of choice. Heavy forces may also be used, especially as part of an integrated light/heavy force. Army aviation has a role to play in each part of this sequence.

b. Aviation brigades must tailor the appropriate task organization based on METT-T and the commander's intent. They must also deploy within the constraints of resources available such as USAF airlift capabilities. The optimum aviation TF may be determined by considering several factors, which are not all-encompassing. Some of these factors include the following:

- Mission, enemy, terrain, troops, and time available.
- The necessity of having aviation forces present early during the deployment phase and the deployment priority for the aviation task force.
- CSS considerations and host nation support capabilities (if available).
- Length of time before follow-on forces arrive.

c. The aviation task force headquarters is normally selected from three organizations within the division aviation brigade: the cavalry or air reconnaissance squadron, the attack helicopter battalion, or the aviation battalion (ABN/LID) or assault helicopter battalion (AASLT). The aviation task force should be balanced; it may require air movement, reconnaissance, or even attack capabilities. Figure D-1 illustrates an example of an aviation task force that has been selected with an air reconnaissance squadron in the AASLT division as the TF HQ. This particular task force is composed of--

- The headquarters and headquarters troop.
- One air reconnaissance troop.
- Two attack helicopter companies.
- Two assault helicopter companies.
- An LRSU (attached).
- An aviation maintenance contact team composed of AVUM and AVIM assets.

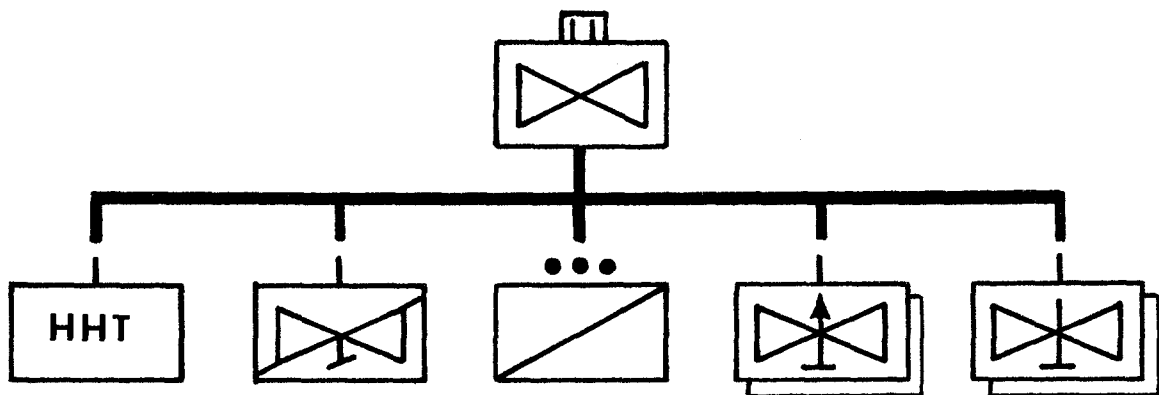


Figure D-1. Composition of the aviation task force

d. Also, the aviation brigade commander can deploy an advanced party. This team may be organized like the tactical CP. The team provides initial coordination and liaison for the TF and follow-on aviation forces. The HHT provides logistical, medical, and ground maintenance support to the TF. Within the HHT, an ATS platoon or section may provide air traffic services. Command aviation assets can be attached to the HHT to provide the task force with C² platforms.

D-6. APPLICATION

AirLand Battle doctrine and the tactics, techniques, and procedures that are evolving from it apply in low-intensity conflict. However, these must be modified to fit the special circumstances in which the military role is indirect and supporting. The commander must consider the conditions discussed above and adjust his course of action to fit the circumstances.

APPENDIX E

NBC OPERATIONS

This appendix implements portions of STANAGs 2002 (Edition Seven), 2047 (Edition Six), 2103 (Edition Five), 2104 (Edition Six), 2889 (Edition Three), and 3497 (Edition One).

Aviation brigades can expect to conduct all or part of their operations in an NBC environment. Aviation forces may typically be the first to encounter NBC conditions on the battlefield. Therefore, brigade commanders must develop an internal organization that will not only support the unit's mission but also support operations in an NBC environment. To accomplish the mission, commanders must prepare their soldiers to fight and win in an NBC environment. They must also train their personnel to exploit friendly nuclear strikes or retaliatory chemical strikes once the Threat employs NBC weapons. This appendix serves as a guide for planning purposes by which commanders and staffs may employ their aviation forces in an NBC environment.

Section I

NBC THREAT

E-1. THREAT DOCTRINE AND PREPAREDNESS

a. The NBC threat can exist anywhere including Third World countries that have an NBC capability. However, aviation brigade commanders must focus on the Soviet Union and Warsaw Pact countries as the most formidable NBC threat. Threat employment doctrine stresses offensive operations and a willingness to use nuclear and chemical weapons to win. Threat leaders know these NBC weapons may alter tactics, advance rates, force and power ratios, and logistics. The Threat can produce and stockpile NBC weapons and employ them with a variety of delivery systems.

b. The Soviets classify nuclear and chemical weapons as weapons of mass destruction when relating them to troop protective measures. However, they consider chemical weapons as conventional when relating them to employment doctrine. The Soviets have many options for employing nuclear and chemical weapons. Thus any future conflict involving the Soviets should be considered likely to include the employment of NBC weapons.

c. The Soviets have developed and fielded a large inventory of defensive equipment, and they have well-trained chemical personnel. As part of their overall preparedness, the Soviets conduct extensive, realistic training. However, NBC warfare will impose the same constraints on Soviet soldiers as it will on US soldiers. Individual protective clothing and psychological factors will also degrade the performance of both Soviet and US soldiers in an NBC environment.

E-2. NUCLEAR WARFARE

a. The Soviet Union has a wide range of systems that can deliver nuclear weapons. As illustrated in Figure E-1, no area on the battlefield is free from the threat of a nuclear strike. The Soviets have stated priorities for nuclear strikes. They include the following in the order of priority:

- Enemy nuclear delivery means, aircraft, field artillery, missiles, and rockets.
- Airfields.
- Division and higher-level headquarters.
- Defensive positions.
- Reserves and troop concentrations.
- Supply installations, especially nuclear ammunition storage points.
- Command, control, and communication systems.

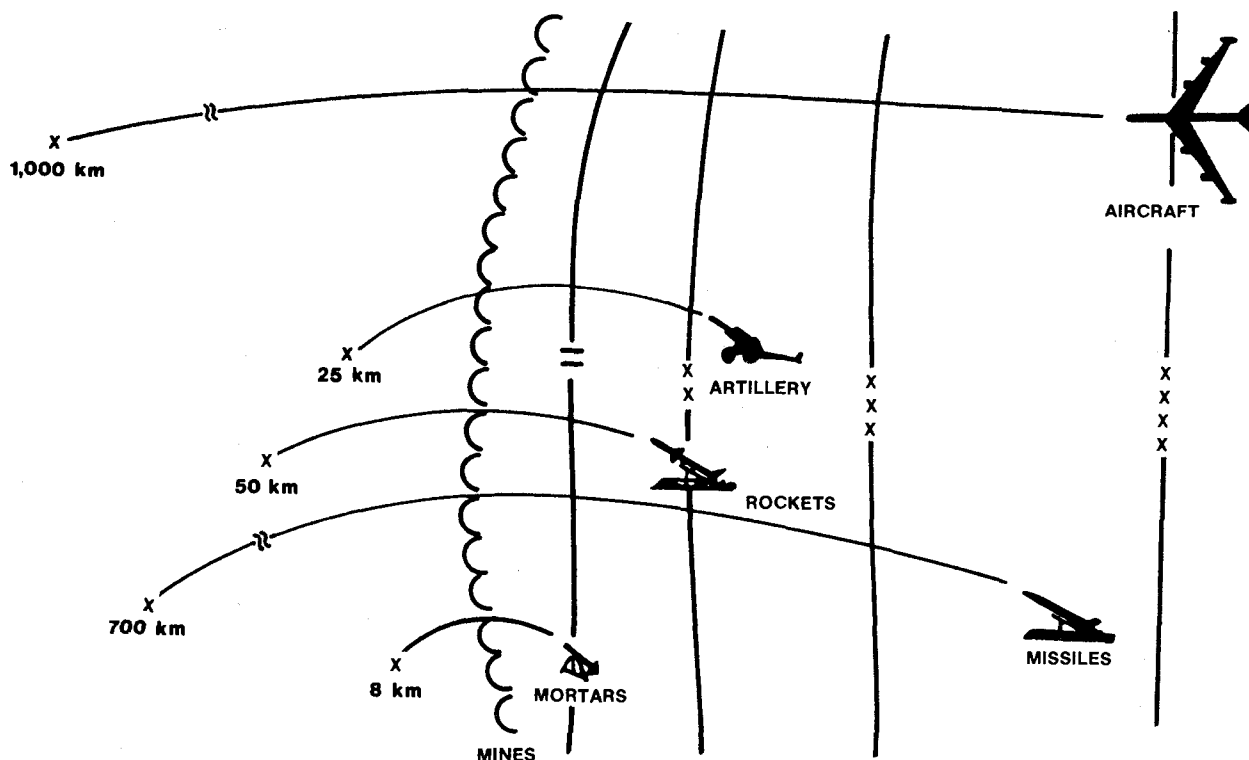


Figure E-1. Range of Threat delivery systems

b. Aviation brigade elements are not directly targeted for a nuclear strike. However, the brigade's mission may place elements in an area where they would become a target for nuclear weapons.

E-3. BIOLOGICAL WARFARE

a. Biological warfare is the intentional use of organisms to cause death or disease in people, animals, or plants. Examples of these living organisms--called germs--are viruses, bacteria, and fungi. Germs can be dispersed by artillery, rockets, aircraft, sprays, vectors, or covert operations. The possibility of biological warfare exists even though treaties prohibit it. The policy of the United States is to never engage in biological warfare.

b. The US defines a biological agent as any living organism or toxin produced by an organism that can incapacitate, seriously injure, or kill personnel. The Threat considers toxins to be chemical agents. The agents covered by biological treaties are bacteriological agents.

E-4. CHEMICAL WARFARE

a. The Soviets classify chemical agents in six major types: nerve, blood, blister, choking, psychochemical, and irritant. The United States classifies chemical agents by physiological categories: nerve, blood, blister, and choking agents. In a nuclear war, chemicals may be used to complement nuclear weapons. Normally, chemicals would be employed after a nuclear strike when protective equipment has been damaged and personnel are physiologically weak. A combination of agents can be used to complicate medical treatment and compound the effects of individual chemical agents. FM 8-9 describes the effect that agents have on the human body. Chemicals do not require pinpoint targeting because of the potential for contaminating a wide area downwind of the attack.

b. Soviet targeting priorities for chemical agent attack are nearly identical to Soviet priorities for nuclear strikes. The Soviets may target airfield and rear area lines of communication to disrupt US resupply and reinforcement operations. However, they might keep these points intact for later use by their forces. The Soviets may target frontline troops, such as reconnaissance or attack forces, with nonpersistent agents. The agents may be delivered by multiple rocket launchers. The Soviets may also target the flanks with persistent agents to act as obstacles and the intermediate rear area with semipersistent attacks to delay the retrograde of friendly forces.

Section II

NUCLEAR WEAPONS

E-5. THERMAL RADIATION EFFECTS

The energy released from a nuclear detonation interacts immediately with the surrounding air. Almost instantly with the detonation, an intense light pulse is emitted. Also, the air is heated to thousands of degrees Celsius, vaporizing even the unreacted bomb material. The sphere of superheated air is called the fireball; the heat and light are referred to as thermal

radiation. Thermal radiation will continue to be emitted from the detonation for several seconds to tens of seconds, depending on the yield of the weapon.

a. Heat Effects. Heat can affect personnel as well as equipment, supplies, and the environment.

(1) Skin burns.

(a) Unprotected or exposed skin is susceptible to thermal radiation burns. These may be first-, second-, or third-degree burns. First-degree burns are similar to a sunburn; they involve injury to the epidermis. In second-degree burns, the epidermal layer is destroyed but some viable tissue remains. These burns usually form blisters. In third-degree burns, the thick epidermis and underlying layer, or dermis, are destroyed. These burns have a dark brown or charred appearance.

(b) The severity of the burns depends on the yield of the weapon, proximity of personnel to ground zero, and level of individual protection. For example, from a 1-kiloton explosion, unprotected skin would receive third-degree burns at 600 meters, second-degree burns at 800 meters, and first-degree burns at 1,100 meters. Wearing clothing that does not leave the skin exposed reduces the chance of severe burns. However, the dark color of the battle dress uniform causes it to absorb more thermal radiation; therefore, early warning and defensive measures must begin as soon as a nuclear threat is discovered. Nomex flight suits somewhat protect aircrews from skin burns.

(2) Materiel damages. Thermal radiation is hazardous to ground support equipment and supplies as well as personnel. JP4 stored in blivets is especially vulnerable. The black rubber in the blivets will absorb thermal radiation and may become heated and hardened. The blast may also puncture or stress the blivets, causing them to leak. Burning rubber, leaves, or grass might ignite the fuel, causing explosions and fires. Personnel (fuel handlers) at FARPs must protect the blivets by burying them or covering them with tarpaulins.

(3) Fires. The heat from thermal radiation may cause fire storms in forests and urban areas. These fires may affect aviation units directly if they are in the path of the storm. Fires will affect aviation units indirectly if they are used to evacuate ground units. Ground personnel may be unable to evacuate such areas with their ground transportation assets because of obstacles such as fallen trees.

b. Light Effects. Light mainly affects personnel. The effects of light on aircrews range from flash blindness to retinal burns.

(1) Flash blindness.

(a) The retina may receive more visible light from a fireball than is needed for light perception but not enough to cause permanent damage. Visual pigments of the photoreceptors bleach out, and vision is briefly impaired. This effect is called flash blindness; it is sometimes referred to

as dazzle. Flash blindness is more of a hazard at night than during the day, because the pupil is larger and admits more light at night. How flash blindness affects military operations depends on the tasks of affected personnel. While the temporary loss of vision may be hazardous to ground soldiers, it could be fatal for aircrews.

(b) The severity of flash blindness is directly related to the yield of the weapon, distance between the fireball and personnel, and atmospheric conditions. Low visibility will reduce the magnitude of the visible light pulse. In the daytime, a 1-kiloton weapon could cause flash blindness from a distance of 6 kilometers. At night, the same weapon would produce flash blindness from a distance of 51 kilometers.

(2) Retinal burns. An excessive amount of light focused on the retina can cause retinal burns. The intense light burns the photoreceptors and causes a blind spot. The damage is permanent, because photoreceptors cannot be replaced. The degree of incapacitation would vary. For example, a person looking directly at the explosion could suffer destruction of the fovea centralis and be considered functionally blind. Another person with a burn in the periphery of the retina might not be aware of the blind spot. Soldiers facing a 1-kiloton detonation could receive retinal burns from as far away as 6.7 kilometers.

E-6. BLAST EFFECTS

The rapid expansion of the fireball creates a wave of compressed air. This is referred to as a shock wave or a blast wave. The blast wave causes damage by two kinds of pressure: dynamic pressure, referred to as winds; and static overpressure, referred to as overpressure. The compressed gases produced by a nuclear explosion expand outward in all directions from the point of detonation. This wave travels at about the speed of sound.

a. Dynamic Pressure.

(1) Wind velocity. The wind velocity can range from a few miles per hour to hundreds of miles per hour. The velocity will depend on the yield of the weapon, height of the burst, and distance from the point of detonation. The wind velocity decreases with distance. For example, a 100-mile-per-hour wind will occur about 6 miles from a 1-megaton detonation, 4 miles from a 300-kiloton detonation, or 1 mile from a 5-kiloton detonation. However, when a nuclear burst first detonates, the observer will be unable to predict the wind force because he will not know the yield of the weapon or the location of ground zero.

(2) Drag forces. The winds cause damage by drag forces. Drag forces cause buildings to collapse and vehicles to overturn and create missiles from flying debris such as rocks, sticks, or glass fragments. They also hurl exposed personnel against structures and solid objects and blow down trees. For nuclear weapons, the time from the initial blinding flash of light until the blast wave reaches the area can be several seconds or longer. For large-yield weapons at great distances, the time can be longer than

30 seconds. Thus personnel will have some time to seek shelter before the blast wave hits.

(3) Wind phases. Winds have a positive phase and a negative phase. During the positive phase, winds travel outward from the point of detonation. As the fireball rises, a slight vacuum is created. This will cause the winds to reverse and blow back toward the detonation. The velocities of this reverse wind are mild compared to the positive phase. The reversal of the winds will keep missiles in the air longer and possibly cause more damage. The missiles may fall back to the ground and settle after the positive phase and then be picked up again by the negative phase. Because of the turmoil, ground troops may not even notice the negative phase. Aircrews may notice it more because wind reversal will create more air instability for them to overcome.

(4) Aerodynamics. The effects of high winds on fixed- and rotary-wing aircraft have been studied in wind tunnels and in open-air testing. Nuclear blast winds have the same effects on aerodynamic surfaces and airframes as any other type of high wind. Nuclear weapons can produce enormous wind velocities, extreme turbulence, and wind shear. The winds persist longer than those produced by conventional munitions. Rotary-wing aircraft may experience sudden yaw, pitch, roll, and lift changes. Extreme effects can include blade flapping and bending, mast bumping, loss of tail rotor effectiveness, flameout, and airframe crushing.

b. Static Overpressure.

(1) Overpressure force. The compressed gases create a force that causes the ambient air pressure to increase; this is overpressure. A conventional high-explosive munition also has an overpressure effect; however, it is not as powerful and lasts only microseconds. The nuclear explosion creates overpressure that can be hundreds of times greater than the ambient air pressure. As with the winds, the overpressure decreases as the distance from the point of detonation increases.

(2) Aircrew injury. Wind velocity and overpressure are inter-related. For example, the wind velocity is about 35 miles per hour at 1 psi overpressure and about 160 miles per hour at 5 psi. At overpressures of .5 psi and greater, windscreens begin to shatter and flying fragments may injure aircrews. At 35 miles per hour, glass fragments are a significant hazard to the eyes and the throat. At higher pressures, the wind velocity could cause casualties from fragments penetrating the flight suit and skin. Also, with the windscreen gone, external missiles may enter the cockpit and cause injuries. The best protection available to aircrews is receiving early warning by radio. Thus the aircrew can land in the lowest terrain possible and place the rear of the aircraft in the direction of the expected blast. This method will increase the aircrew's survivability. The distance from the blast will determine the degree of damage to the aircraft.

(3) Airframe damage.

(a) Airframes are vulnerable to overpressure effects. Glass (Plexiglas, safety Plexiglas, or safety glass) begins to shatter at .5 to 1 psi overpressure. At .5 to 2 psi, larger windows that face the point of detonation shatter first. As the overpressure increases (2 to 5 psi), all windows will shatter. Overpressure may cause glass to implode initially. Then the positive wind phase creates missiles of the glass fragments.

(b) The overpressure initially affects only the side facing the detonation. However, the blast wave envelops the aircraft within micro-seconds, exerting forces on the opposite side as well. The sequential occurrence creates buckling and twisting forces, resulting in skin wrinkling and internal frame stresses.

(c) Light damage to the airframe, other than glass, begins to occur at 3 to 5 psi overpressure. On rotary-wing aircraft, the tail boom weakens and may undergo slight separation. Subsequent severe flight maneuvers may result in tail boom failure. On all aircraft, the fuselage and internal frames undergo substantial stresses and skin panels rupture. Longerons, stringers, and frames may fail at these pressures.

E-7. NUCLEAR RADIATION EFFECTS

Nuclear radiation consists of all types of ionizing electromagnetic and particulate radiation; specifically, alpha, beta, neutron, and gamma. FM 8-9 describes the effects of each type of radiation on the human body. Nuclear radiation travels outward in all directions from the detonation point. The effects of nuclear radiation are categorized as initial and residual.

a. Initial Effects. The initial effects are those manifested within 60 seconds after detonation. They consist of all types of electromagnetic and particulate ionizing radiation. For small yields, the initial radiation will cause numerous personnel casualties. However, an aircraft flown close enough to the nuclear detonation for the aircrew to receive incapacitating dosages would probably not survive the blast damage anyway. This initial radiation remains a concern for aircrews on the ground and personnel in FARPs, AVIM units, and headquarters.

b. Residual Effects. The residual effects are those that remain hazardous after 60 seconds. The most important residual effects are fallout and induced radiation or neutron-induced gamma activity.

(1) Fallout. The fireball continues to grow after a nuclear detonation, stabilizing within several minutes. Because hot air rises, it also gains altitude as it grows. The rising and cooling of the fireball create an area of low pressure directly beneath the fireball. If the point of detonation is close to the earth's surface, then the dirt and debris are drawn up into the fireball. Vaporized bomb material then mixes with the dirt and debris. The mixture of radiological dirt and debris, called fallout, begins to fall back to earth and may cover hundreds of kilometers as it travels downwind. Fallout can result in significant radiation dose-rate levels and

communication blackouts from large quantities of dust and debris in the atmosphere. Large particles may also cause structural damage and FOD to aircraft.

(2) Induced radiation or neutron-induced gamma activity. Neutron radiation occurs only during the initial nuclear reaction. However, neutrons can cause other elements to become radioactive. The ground directly below the point of detonation will most likely become radioactive. This induced pattern, usually not exceeding two kilometers in diameter, will present a significant radiation hazard for ground personnel for two to five days after the burst. The extent of the hazard can be determined by reconnaissance or survey teams.

c. Radiation Exposure and Sickness. Aircrews exposed to radiation may exhibit certain symptoms. The onset of radiation symptoms, their severity, and their duration generally depend on the amount of radiation the individual receives and variables such as health, previous exposure, and injury. Before directing aircrews into areas of suspected or known radiation contamination, aviation commanders must evaluate the essentiality of the mission. Aircrews can use radiac meters in aircraft to measure total dose rates. Commanders can then evaluate the effects of aircrew exposure and anticipate aircrew ability to perform future missions. Table A-1 shows the biological effects of a range of radiation doses. The table also shows the effects of mid-range doses on performance. An individual exposed to radiation may have alternating periods of performance degradation, combat effectiveness, and combat ineffectiveness. For example, an undemanding task in the 500- to 800-rad range may cause an individual's performance to be degraded initially for up to two days; then the individual briefly regains combat effectiveness; thereafter, the individual's performance is again degraded and deteriorates until he becomes combat ineffective.

(1) Radiation exposure. Radiation exposure considerations are much the same for aviation personnel as for ground personnel. However, the aviation commander has the more difficult job of determining when an aircrew becomes ineffective from radiation exposure. FM 101-31-1 contains additional information on radiation effects.

(2) Radiation sickness. Aviators must be alert to symptoms that impair their ability to fly. Leaders should observe their personnel closely to detect behavior that may necessitate grounding them. Initial symptoms of radiation sickness--such as nausea, fatigue, and listlessness--may mimic those of other illnesses. Flight surgeons should monitor radiation exposure and provide appropriate guidance to the commander.

E-8. ELECTROMAGNETIC PULSE EFFECTS

The EMP is a wave of electromagnetic energy produced by a nuclear detonation when gamma rays make contact with the atmosphere. It occurs immediately after nuclear detonation and travels outward in all directions. EMP presents no significant biomedical hazard to humans. However, it can damage electronic components. Because EMP is a form of electricity, it will follow the path of least resistance into electrical equipment.

Table E-1. Expected response to radiation

Free-in-Air Dose Range cGy (rads)	Initial Symptoms	Performance (Mid-Range Dose)	Medical Care and Disposition
0 to 70	From 6 to 12 hours: none to slight incidence of transient headache and nausea; vomiting in up to 5 percent of personnel in upper part of dose range.	Combat-effective.	No medical care; return to duty.
70 to 150	From 2 to 20 hours: transient mild nausea and vomiting in 5 to 30 percent of personnel.	Combat-effective.	No medical care; return to duty; no deaths anticipated.
150 to 300	From 2 hours to 2 days: transient mild to moderate nausea and vomiting in 20 to 70 percent of personnel; mild to moderate fatigability and weakness in 25 to 60 percent of personnel.	DT: PD from 4 hours until recovery. UT: PD from 6 hours to 1 day. PD from 6 weeks until recovery.	In 3 to 5 weeks: medical care for 10 to 50 percent. At low end of range, death may occur for less than 5 percent; at high end, death may occur for more than 10 percent; survivors return to duty.
300 to 500	From 2 hours to 3 days: transient moderate nausea and vomiting in 50 to 90 percent of personnel; moderate fatigability in 50 to 90 percent of personnel at high end of range.	DT: PD from 3 hours until death or recovery. UT: PD from 4 hours to 2 days. PD from 2 weeks until death or recovery.	In 2 to 5 weeks: medical care for 20 to 60 percent. At low end of range, death may occur for less than 10 percent; at high end, death may occur for more than 50 percent; survivors return to duty.
500 to 800	Within first hour: moderate to severe nausea, vomiting, fatigability, and weakness in 80 to 100 percent of personnel.	DT: PD from 1 hour to 3 weeks. CI from 3 weeks until death UT: PD from 2 hours to 2 days. PD from 7 days to 4 weeks. CI from 4 weeks until death.	In 10 days to 5 weeks: medical care for 50 to 100 percent. At low end of range, death may occur for more than 50 percent in 6 weeks; at high end, death may occur for 90 percent in 3 to 5 weeks.
800 to 3,000	Within first 3 minutes: severe nausea, vomiting, fatigability, weakness, dizziness, and disorientation; moderate to severe fluid imbalance and headache.	DT: PD from 45 minutes to 3 hours. CI from 3 hours until death. UT: PD from 1 to 7 hours. CI from 7 hours to 1 day. PD from 1 to 4 days. CI from 4 days until death.	Medical care from 3 minutes until death. 1,000cGy: 100 percent deaths in 2 to 3 weeks. 3,000 cGy: 100 percent deaths in 5 to 10 days.
3,000 to 8,000	Within first 3 minutes: severe nausea, vomiting, fatigability, weakness, dizziness, disorientation, fluid imbalance, headache, and collapse.	DT: CI from 3 to 35 minutes. PD from 35 to 70 minutes. CI from 70 minutes until death. UT: CI from 3 to 20 minutes. PD from 20 to 80 minutes. CI from 80 minutes until death.	Medical care from 3 minutes until death. 4,500 cGy: 100 percent deaths in 2 to 3 days.
Greater than 8,000	Within first 3 minutes: severe and prolonged nausea, vomiting, fatigability, weakness, dizziness, disorientation, fluid imbalance, headache, and collapse.	DT and UT: CI from 3 minutes until death.	Medical care needed immediately. 8,000 cGy: 100 percent deaths in 1 day.

LEGEND: CI--combat ineffective (less than 25 percent performance)
DT--demanding task
PD--performance degraded (25 to 75 percent performance)
UT--undemanding task

a. Component and Aircraft Systems Damage.

(1) Component damage. EMP can affect any electrical component. A sudden surge of EMP will cause overvoltage, shorting out wiring and transistors. Vacuum tubes may be somewhat affected by EMP, but more energy is required to destroy them. EMP can enter through the casing of radios and destroy them. It can destroy circuitry even with radios turned off and antennas disconnected. The severity of the damage depends greatly on component design. Testing continues to determine the extent to which a system can be disabled by EMP damage. Not every electrical component will be destroyed by EMP. Some components may only be temporarily disabled.

(2) Aircraft systems damage. Aircrews should know which aircraft electrical systems are critical and how failure of those systems will affect the flight. For example, some aircraft instruments may be disabled, radios or navigational aids may not work, or visual or targeting aids may fail.

b. Communication Net Impairment. EMP will affect the command and control nets of the aviation brigade. Because the brigade is highly mobile and dispersed over a wide area, radio is the primary means of communication. Commanders must be prepared for EMP degradation by training with backup units and alternate means of communication.

Section III

BIOLOGICAL AGENTS

E-9. LIVING ORGANISMS

Classical biological agents include anthrax, plague, smallpox, botulism, typhoid, and microtoxins. These agents are living organisms that usually require a host body to mature. Because the effects of these agents are usually delayed, a natural outbreak may be difficult to differentiate from a covert attack. Some agents are highly persistent, while others have a short life span outside the host body.

E-10. TOXINS

Toxins are poisonous chemical substances produced by living organisms. They are found in nature but only in small quantities. Microorganisms, plants, animals, reptiles, and insects produce toxins.

a. Common Toxins. Some commonly known lethal toxins that microorganisms produce are botulism, staphylococcus, and tetanus. Other toxins are produced by poison ivy, snakes, poisonous frogs, bees, spiders, and scorpions. Their toxicity ranges from extremely lethal to simple harassment such as an ant bite.

b. Yellow Rain. Tricothecene toxin is also known as yellow rain. T2, as it is commonly called, is a by-product of the respiration process of an

organism that grows on decomposing grains. Individuals exposed to large doses of T2 soon experience an onset of violent itching, vomiting, dizziness, and distorted vision. Within a short time, they vomit blood-tinged material and later larger quantities of blood. The affected individuals die within hours, manifesting shock-like symptoms. Personnel may be exposed to smaller doses directly or indirectly through consumption of contaminated water or food. These individuals experience a slower onset of similar symptoms along with bloody diarrhea. Many die eventually of dehydration. Survivors may take several months to heal.

c. Botulism. Another highly lethal toxin is the by-product produced by clostridium botulinum. This agent causes botulism and is extremely lethal to humans. It is several times more lethal than any of the standard chemical agents.

E-11. EFFECTS

Mild exposures to biological agents can severely degrade performance. Many of the classical diseases have delayed effects, whereas the effects of most toxins are immediate. Toxins can create area contamination as well as downwind and vertical vapor hazards. Medical personnel, especially flight surgeons, must constantly monitor aviation personnel to detect unusual symptoms that may indicate exposure to a biological agent. FM 8-9 contains detailed information about the effects of biological agents.

E-12. PROTECTION

Commanders must be prepared to protect against biological agents used by an enemy. The US has immunization programs for many of these agents to help protect personnel against the diseases.

Section IV

CHEMICAL AGENTS

E-13. NERVE AGENTS

a. Effects.

(1) Even extremely low dosages of nerve agents can disable personnel. The dosages can degrade the ability of aircrews to operate aircraft and ground personnel to support aviation operations. Nerve agents will severely disable personnel in any occupation requiring dexterity and high mental function. Nerve agent exposure is cumulative, so repeated exposure to low dosages will result in a cumulative increase in personnel disabilities.

(2) Nerve agents are lethal in either vapor or liquid form and can be employed as nonpersistent or persistent agents. They cause casualties through any portal of entry: respiratory tract, skin, eyes, or mouth. (They

are usually ingested by mouth with contaminated food or water.) Within one to two breaths after aircrews have flown into a vapor cloud, they can inhale sufficient agents to cause initial convulsive movements of extremities within 30 seconds; progressively to collapse and unconsciousness within one minute; and to flaccid paralysis, respiratory failure, and death within two to three minutes. When agents are ingested in contaminated food or water, symptoms may vary or be delayed.

(3) Low dosages of a nerve agent will also cause miosis. Symptoms of miosis are pinpointed pupils, blurred vision, and eye pain. The victim cannot adapt to night vision because the dark adaptation of the rods in the peripheral portion of the retina is restricted. Miosis may last for hours or several days. Full recovery may not occur for weeks. Symptoms of miosis may be evident in the absence of any other nerve agent symptom.

(a) The absence of miosis does not exclude nerve agent poisoning, especially in cases of ingestion or skin exposure. Miosis may occur almost immediately after exposure, or it can be delayed 30 minutes or longer after a mild exposure. When drinking with the M24 mask on, personnel must shut their eyes until the mask is cleared. This will lessen the chance of the eyes absorbing tiny doses of nerve agents. Eye drops may be administered to relieve pain, but they do not return vision to normal. Recovery time depends on individual reactions. Near vision, night adaptation, far vision, and accommodation will slowly return to normal in varying degrees.

(b) During bright daylight, the only effect of miosis on vision may be dimness of vision. During periods of low visibility and at night, dusk, and dawn, the impact of miosis may be significant. Aircrews may not be able to fly.

(c) The impact of miosis on personnel is not limited to aircrews. Ground support personnel in ATS and AD units and command and control facilities will also be affected by miosis. This degradation of support capability will affect all aviation missions.

b. Antidotes. The nerve agent antidote treatment available for soldiers is the nerve agent antidote kit. Each NAAK includes one atropine auto-injector and one pralidoxime chloride autoinjector. STP 21-1-SMCT, FM 8-285, and FM 21-11 describe the procedure for administering the nerve agent antidote.

(1) The NAAK will keep a nerve agent victim alive; every soldier must be thoroughly trained in its use. Nerve agents are powerful and require powerful antidotes to keep the victim alive. The NAAK must not be used on a person unless he has actually been exposed to a nerve agent. However, some personnel may panic during the initial encounter of chemical warfare on the battlefield. Many symptoms of other chemical agents, especially toxins, overlap nerve agent symptoms. Therefore, soldiers may misdiagnose the symptoms.

(2) The effects of atropine and pralidoxime chloride on aircrews are being studied. Serious side effects may impact on a person's fitness for

flying duty. When an adequate dose of atropine is injected for lifesaving measures, dryness of the mouth is a side effect. This side effect will also occur even if no agent is present in the body and atropine is injected. Three autoinjections may cause hallucinations. One autoinjection will probably not seriously degrade an aircrew's ability to function. Some side effects of atropine are denial of illness, loss of insight, and loss of consciousness. Other symptoms include perceptual difficulty, judgment and memory impairment, confusion, short attention span, slurred speech, and restlessness. These reactions are also similar to the symptoms experienced from incapacitating agents such as psychochemicals, cocaine, and cannabis.

(3) The current nerve agent pretreatment drug is pyridostigmine. The pretreatment is taken every eight hours. The unit commander will determine when personnel will begin taking the pretreatment. FM 8-285 contains pretreatment procedures.

E-14. BLOOD AGENTS

a. Effects. Blood agents are nonpersistent agents and have an effective duration of from ten minutes to two hours. Within one or two breaths, individuals can inhale a lethal dose of blood agents. Death may follow within one minute. Mild exposure will result in the same symptoms as those experienced from lack of oxygen. Soldiers who survive moderate to severe exposure may not be able to return to flying status for several weeks or longer. The damage to cells caused from lack of oxygen may result in persistent fatigue, irrationality, loss of coordination, vertigo, and headaches. One type of blood agent, CK, causes chronic bronchitis.

b. Antidotes. No current self-aid/buddy aid antidote exists for blood agents.

E-15. BLISTER AGENTS

Blister agents cause severe skin blisters and respiratory damage. These persistent chemical agents can cause injury in both liquid and vapor forms. These blisters damage the subdermal layers of skin and cell protein structure and take from weeks to months to heal. Very low concentrations of blister agents cause painful eye damage, to include conjunctivitis, edema of the lids, and a feeling of grit in the eye. In large concentration, mustard agents can cause permanent damage, corneal scars, or opacity. A tiny amount of liquid droplet (Lewisite or phosgene oxime) in the eyes may cause permanent injury or blindness. Blister agents cause systemic poisoning throughout the body and can impair performance. Some symptoms are blood pressure decrease, nausea, malaise, and dehydration. Blister agents are not usually lethal, but severe respiratory damage, secondary infection, or dehydration may cause death. FM 8-285 contains treatment procedures for blister agents.

E-16. CHOKING AGENTS

Choking agents are nonpersistent agents that can cause injury to unprotected personnel. The injury may result in mild eye irritation and damage to the lungs and respiratory tract. The initial choking effect may cause loss of

aircraft control. In severe cases, membranes swell, the lungs fill up with fluids, and death results from a lack of oxygen. FM 8-285 contains treatment procedures for choking agents.

E-17. INCAPACITATING AND RIOT CONTROL AGENTS

Irritating agents and psychochemical agents employed by the Threat are not usually lethal. They should not cause death unless personnel are exposed to much larger concentrations than would normally be employed on the battlefield. FM 3-9 describes these agents in detail. FM 8-285 describes the effects of these agents and treatment procedures.

E-18. PROTECTION

Even a mild exposure to agents may be fatal to aircrews, because aircraft control may be lost. Also, the long-term, systemic effects of agents and treatments can degrade performance, causing aircrews to be grounded. Flight surgeons must carefully monitor aircrews for symptoms of exposure to agents and advise the commander. When personnel are not wearing NBC protection and exposure to agents is suspected, they may be temporarily grounded and observed for symptoms. However, in the absence of actual symptoms, the tactical situation may preclude preventive grounding. Aircrews should wear full MOPP4 gear during flight, and ground troops must also have adequate protection. Local commanders will make this decision based on METT-T and a risk analysis.

Section V

NBC DEFENSE FUNDAMENTALS

E-19. CONTAMINATION AVOIDANCE

Contamination avoidance--the first fundamental of NBC defense--means taking the appropriate action to reduce NBC hazards. The term avoidance does not necessarily mean aborting a mission or canceling an operation just because contamination is present. The factors of METT-T are considered for all operations, to include entering contaminated areas and preparing to encounter unknown contaminated areas. Soldiers go into hazardous areas only when necessary. Aviation brigades use the NBC warning and reporting system and reconnaissance, monitoring, and survey to help locate contaminated areas.

a. Contamination Transfer.

(1) All soldiers should understand how they and their equipment become contaminated and how contamination spreads to other personnel and equipment. Contamination refers to the deposit or absorption of hazards. A unit may be the target of a Threat NBC attack, or the downwind hazard from a contaminated unit may cause agents to drift into another unit's area. Also, a unit may move or fly into contaminated areas from which aircraft can transport contaminated equipment or personnel.

(2) Rotary-wing aircraft can transfer contamination from the ground into the aircraft or vice versa. This transfer occurs when the rotor wash picks up dust, sand, leaves, or other contaminated debris. The debris or liquid droplets are then scattered throughout the aircraft. Some agents are like a fine spray and, although suspended in the air, can settle on personnel or equipment like dew. Aircraft vibrations increase the settling of agents in remote areas of the airframe such as panel points or rivets. Also, the type of paint on the aircraft affects contamination. Alkyd-based paints absorb the agents like sponges. Newer paints are being developed, such as agent-resistant coatings, that resist chemical agent absorption.

b. Principles. The principles of contamination avoidance are applying passive defensive measures; warning and reporting; locating, identifying, and marking NBC hazards; limiting the spread of contaminants; and avoiding contaminants.

(1) Applying passive defensive measures. Passive defensive measures reduce the chance of being hit by an NBC attack or, if hit, the aftereffects of the attack. They are not direct reactions to a specific attack but rather are measures taken to reduce vulnerability to being targeted. Each unit must apply the principles of detection avoidance, dispersion, and training to protect personnel and materiel.

(a) Detection avoidance. Commanders must train their units in the principles of detection avoidance. If the Threat does not know the location of aircrews, it cannot target them for an NBC attack. Commanders should carefully choose unit positions and CP locations. They must ensure that their troops are protected as much as possible from Threat detection by using natural concealment, cover, and camouflage. In addition, aviation units can use air routes and firing positions that take advantage of natural vegetation and terrain features. These same principles apply to ground units.

(b) Dispersion. In some cases, the terrain will not be suitable for concealment. However, commanders can disperse their assets so that the unit presents a less lucrative target. By constantly varying the pattern of unit deployment, the commander avoids stereotypic patterns that allow the Threat to identify the type of aviation unit being observed.

(c) Training. Units must train to survive initial NBC attacks and to continue their missions without slowing down. One goal of this training is to render Threat weapons ineffective.

(2) Warning and reporting. Once an NBC attack has occurred and personnel have located an area that is contaminated or is threatened by downwind hazards, they must inform affected units without delay. Early warning will give personnel time to protect themselves against the hazard. The warning and the reporting of attacks are done by simple, standard messages with the NBCWRS. The NBCWRS consists of standard reports, system management, and attack warnings. A recent addition to standard reports includes an NBC-6 summary report on chemical and biological attacks. Another addition is a chemical downwind message that gives surface meteorological data so that

personnel can prepare fresh chemical downwind hazard predictions. FM 3-3 and GTA 3-6-3 show report formats.

(a) Collection sources. NBC information is collected from numerous sources. It may be obtained from a direct attack on a unit or after an attack through reconnaissance, monitoring, and survey operations conducted by the aviation brigade or a subordinate unit. Units in attack or hazardous areas will forward monitoring reports.

(b) Observers. For nuclear weapons, only designated observers will automatically forward reports on burst parameters. Nondesignated observers collect the information and hold it until it is requested. The squadron commander may select several aircrews as designated aerial observers. Their mission, like that of ground observers, is to obtain nuclear burst information. Aviation units can obtain good visual data such as cloud parameters, approximate ground zero location, and crater size. However, the designated aerial observer team does not necessarily comprise the same personnel as the survey team. Troop commanders determine the composition of the team. Utility or observation aircraft are probably best suited for the designated aerial observer mission.

(c) FARP elements. The commander must forward hazard information to FARPs and other separate activities. These elements need hazard information for selecting routes, setting up sites, and selecting clean areas for rest and relief. Unit SOPs should address how messages will be forwarded. Radio communications with ATS facilities may be used as an alternate method of relaying hazard information to FARPs. The FARP will probably become contaminated while support aircraft will remain clean. However, the opposite may also occur. Therefore, aircrews and FARP personnel should establish a standard method of communicating NBC hazard warnings between them. Hand-and-arm signals, panels, flags, or any other type of standard signal should be included in unit SOPs.

(d) Attack warnings. Nuclear weapons pose significant hazards to aircraft, whether they are fired by Threat forces or by friendly forces. Therefore, commanders must have a thorough understanding of the attack warnings so that the capabilities of aviation assets are not degraded. Warnings of friendly nuclear and chemical attacks ensure that friendly forces have time to protect themselves from the attacks. These warnings are called STRIKWARNs or CHEMWARNs. FM 3-3 and GTA 3-6-3 outline the message formats. The executing commander is responsible for starting the warning. Messages must be sent to adjacent units and to the subordinate headquarters whose units are likely to be affected by the attack. When a nuclear strike is canceled, units warned previously must be notified without delay. Local policies may specify a wait time after the planned time of detonation when the message is automatically canceled. Aviation assets are dispersed throughout the battlefield. The supported unit may not be inside a STRIKWARN zone; therefore, it may not receive the warning. However, aircraft supporting that unit may be where overpressures will cause damage. Because of the long-distance hazard of nighttime flash blindness, aviation units must know when friendly nuclear weapons will be fired. For these reasons, executing commanders should send the attack warning to all aviation units. This

message should include the limited safe distance for aircraft or the 1-psi overpressure radius. The limited safe distance is not included in the standard format for STRIKWARNs, but it can be added. All aviation assets, including ground support, must receive information about friendly nuclear strikes. ATS facilities will be used to the maximum extent to relay STRIKWARNs to aircraft operating within the effective ranges of nuclear detonations. Units should develop alternate methods of passing an immediate warning to aircraft during flight.

(3) Locating, identifying, and marking NBC hazards.

(a) Once personnel detect an NBC hazard, they must mark and identify the hazard. Units must plan their area of operations outside of the contaminated area when possible. The unit has three methods of determining the limits of a contaminated area: reconnaissance, monitoring, and survey. Contaminated hazards may be the result of enemy or friendly forces. In either case, the effects are the same; they will affect either Threat or friendly operations equally. Therefore, hazardous areas must be located, identified, and marked especially along defiles, routes, and point hazards. Marking may be immediate or hasty. Hazardous areas may be permanently marked later with standard NATO signs.

(b) Aviation assets are ideally suited for conducting reconnaissance and radiological surveys. FM 1-117 and FM 3-3 discuss radiological surveys.

(c) Chemical agent detectors or alarms are not mounted on aircraft. Using aircraft with point detectors in this role is not considered a feasible mission. Chemical reconnaissance with aircraft will be limited to flying a chemical detection team to selected areas. NBC detection equipment consists of standard issue items such as radiological detection and monitoring devices, total dose instruments, and chemical agent detection kits and alarms.

(d) Aircrews can help identify contamination on or in the aircraft. They can mount M8 or M9 chemical agent detection paper on the inside or the outside of the airframe at various locations. Because the paper does not stick to the paint on the aircraft, it should be wrapped around a painted area with the ends of the paper overlapping. Recommended areas for mounting this paper include the inside and outside of Plexiglas, seat frames, landing gear, floor panels, or other areas where agents are likely to collect. When the paper is placed on exterior Plexiglas, the spots can be seen from inside the cockpit during the day. Ground support personnel can read the paper on other exterior surfaces. Personnel should not use the paper in a way that creates an FOD hazard.

NOTE: M9 paper detects liquid agents; however, the M9 paper may not react significantly to a vapor or an aerosol hazard.

(4) Limiting the spread of contaminants.

(a) When operating in a contaminated area, all personnel must take steps to limit further exposure to the hazard. One solution is to move personnel out of the contaminated area if the factors of METT-T permit. Aviation assets can often find clear routes through a contaminated area so that exposure to NBC hazards is reduced. If movement is not possible, the unit must employ individual and collective protection measures to prevent casualties. Almost any shelter that protects from the weather will also protect somewhat from fallout and liquid chemical agents.

(b) Personnel can cover ground equipment in the FARP and rear areas to avoid direct contact with contaminants and then discard the covers to operate the equipment. Examples of covers are tarpaulins, plastic bags, and cardboard boxes. If possible, personnel should keep equipment in original containers; for example, ammunition cans. Personnel can also place equipment in covered vehicles or shelters and operate it from these locations. These measures decrease the amount of contamination transfer and may reduce the need for decontamination.

(c) Protective measures for aircraft are similar to those for ground equipment. Areas that provide natural cover should be used for unit locations. Aircrews can park aircraft near buildings in built-up areas for limited protection. If assault or medium helicopter units pick up or deliver troops in contaminated LZs, aircrews must ensure that doors, vents, and windows are closed to reduce contamination transfer.

(d) Placing a cover on the floor of the cargo area also helps reduce the amount of contamination transfer to the interior of the aircraft. Plastic covers, tarpaulins, paper, cardboard, clothing, or even leaves can aid in limiting contamination transfer. However, covers must be secured so that they do not present an FOD hazard. When flying rotary-wing aircraft out of contaminated areas and into clean areas, aircrews should open all doors and windows. About 20 minutes of flight will rid the aircraft of accumulated vapor hazards, but liquid contaminants will remain a hazard.

(5) Avoiding contaminants.

(a) The best way aircrews can keep aircraft free from contamination is to avoid flying them into contaminated areas. However, aircrews have no onboard means of determining, in the air or on the ground, which areas are contaminated. Therefore, they may be unable to avoid contaminated areas. Contamination avoidance also applies to ground support locations such as FARPs. FARPs are vulnerable because of their mission, but their mobility may lessen the chance of their being targeted by Threat forces. Aircraft are also vulnerable while being serviced at FARPs.

(b) Commanders must rely heavily on the NBCWRS and intelligence reports to learn what battlefield areas are contaminated. However, some areas may not be reported and new attacks may occur at any time.

(c) Another source of information comes from the supported unit. Commanders should select alternate locations where they can complete their mission if the area of operations becomes contaminated. The flexibility of aviation assets allows aircrews to "fly around" known contaminated areas and still accomplish the mission. When choosing among options, however, the commander knows the primary consideration is always mission accomplishment.

E-20. PROTECTIVE MEASURES

Protection--the second NBC defense fundamental--is both individual and collective. When the unit cannot avoid contamination or is under direct attack, soldiers must take appropriate actions to survive. Specific actions are taken before, during, and after an attack. To sustain operations in an NBC environment, unit personnel must understand and practice individual and collective protection. Individual protection involves those measures each soldier must take to survive and continue the mission. These include acting immediately upon observing a nuclear detonation, donning MOPP gear, and wearing other protective equipment and devices. Collective protection provides a contamination-free working environment for selected personnel and precludes the continuous wear of MOPP gear.

a. Individual Protective Equipment and Clothing.

(1) MOPP gear. Soldiers are issued MOPP gear to protect themselves from a chemical or biological hazard. MOPP gear consists of the CB protective mask, hood, overgarment, overboots, protective gloves, individual decontamination kit, detection equipment, and antidotes. FM 3-4 describes each item, to include service life and proper use.

(2) Nomex flight suit and gloves. Until a fire-retardant overgarment is fielded, aircrews will continue to wear the Nomex flight suit and gloves under the overgarment and protective gloves. When aircrews wear the Nomex gloves, they do not need to wear white cotton inserts.

(3) Aviation life support equipment. All soldiers must be issued a mask, an overgarment, and protective gloves in the correct sizes. Soldiers should ensure that they have the correct glove size so that their tactile sensitivity is not degraded. The size of the overgarment depends on the unit's policy for wearing ALSE. Usually, soldiers will wear the ALSE over the overgarment. During an emergency in a CB environment, aircrews need access to the contents of the survival vest. If the vest is worn under the overgarment, the soldier risks contamination to get to the vest. Commanders should carefully evaluate their policy and requisition overgarment sizes accordingly.

(4) Night vision devices. Current procedures state that aircrews should wear the mask hood over the flight helmet. When flying with night vision devices that attach to the flight helmet, aircrews will have to wear the hood under the flight helmet. Units preferring this procedure should procure the hood for the M25 mask, which is designed to be worn under the

helmet. Wearing the hood under the helmet creates more hot spots; individuals may need to be refitted with a larger size helmet.

(5) M10A1 canister. Commanders should carefully evaluate whether individuals should change their own canisters. Changing the M10A1 canister is currently an organizational-level maintenance task. However, aviation personnel are widely dispersed on the battlefield, and maintenance or NBC personnel may not be available to change the canisters. Blood agents will degrade the canister, requiring the operator to change it after an attack. Therefore, aircrews should receive training in the procedure for changing the canister.

(6) M24 mask. When wearing the M24 mask while operating the AH-1 telescopic sight unit, aviators should be careful not to scratch the mask lens. They should use a clear visor over the mask lens to prevent scratches. Some aviation units will receive M43 masks to replace the M24 masks.

(7) Mask carrier.

(a) In some aircraft, aircrews may not have room to wear the mask carrier during flight. If not, the items from the carrier that are needed during flight should be stored in the aircraft or in the protective clothing. Units should establish a policy so that aircrews know what procedures they are to follow. The procedures will vary with the type of aircraft; therefore, units are encouraged to examine several possibilities and then establish standard procedures for each aircraft.

(b) Some of the items that will be needed during flight are the antifog kit, M258A1 skin decontamination kit, antiglare shield, and antidotes. Soldiers can take the packets of the decontamination kit from the hard plastic container and put them in overgarment pockets. Also, personnel can make a storage area inside the cockpit for the carrier or the M258A1 kit and antidotes.

(8) Skull cap. Some personnel have procured the skull cap, a small cap of Nomex material worn under the flight helmet to keep the helmet from irritating the scalp. The skull cap can be worn under the mask head harness if it does not interfere with the seal of the mask about the face. If the cap is worn inside out, the seams will not dig into the scalp and cause more irritation.

(9) Overboots. Overboots can present a safety hazard (foot slippage) if personnel use laces stretched from wear or do not tie the laces properly.

(10) Gloves. During maintenance, such as preflight, postflight, and FARP operations, personnel can easily tear their protective gloves on the aircraft. When personnel perform maintenance tasks, they should consider wearing a leather glove over the CB protective glove; but they should remove the leather glove before they fly.

(11) CB mask. The CB mask is required for protection against chemical agents. However, it can also protect aircrews from radioactive dust while they conduct aerial surveys or other missions over radiologically contaminated areas. The mask filters out dust or dirt that has radiological agents. In the absence of a CB threat, soldiers may wear other protection such as surgical masks or handkerchiefs. Aircrews may elect to wear the CB mask to keep the large amounts of dust that are present from irritating the eyes.

(12) Faceform. A faceform is used to store the M24 mask to prevent face set. Units may elect to keep the faceform in place to lessen the damage when the mask is being carried. The unit SOP should specify when to carry or remove the faceform.

(13) External drinking adaptor. TM 3-4240-280-10 and STP 21-1-SMCT describe the procedures for drinking water when personnel wear the M24 mask.

b. Mission-Oriented Protective Posture. Commanders select a level of protection based on the chemical or biological threat, temperature, work rate, and mission. The levels of protection are MOPP zero through MOPP4 plus a mask-only option. FM 3-4 describes the MOPP levels and option.

(1) In-flight MOPP status. Aircrews fly in MOPP4 gear when a high threat of CB agent use exists or when agents have been used on the battlefield. Aircrews also fly in MOPP4 gear when they conduct NBC reconnaissance operations. Some of the reasons for this are as follows:

- Personnel cannot detect agents with their senses.
- Agent clouds travel vertically as well as horizontally.
- Aircrews exposed to CB agents may be grounded for an extended period.
- Aircraft are not equipped with advanced warning or detection devices.
- It is not practical to don CB equipment, including the mask, during flight.
- Aircrews exposed to sublethal dosages of CB agents during flight may lose control of the aircraft and crash.
- Rotor wash may transfer droplets or contaminated dust inside the cockpit, creating a skin contact hazard.
- Aviation missions cover large areas, and agents may be present where troops are unavailable to report the attack.
- Even when agent hazard areas are marked on a map, winds and temperature gradients may change during the mission.

(2) On-the-ground MOPP status. When aircrews are on the ground, the MOPP status will depend on the ground situation. Preflight and postflight

inspections may be conducted with a lower MOPP level if the ground situation does not require MOPP4. When aircrews fly in MOPP4 gear in uncontaminated aircraft, they may fly into known clean areas for rest and relief. If ground support areas (such as FARP, troop, or maintenance areas) are clean, aircrews may lower their MOPP status once they are on the ground.

c. Performance Degradation and Countermeasures. CB protective equipment will keep soldiers alive. However, the equipment degrades performance because it hinders dexterity, limits vision and movement, and increases heat stress. Commanders must weigh actual performance degradation against perceived problems with the equipment. MOPP gear has a physiological and psychological impact on personnel. Higher MOPP levels will greatly increase the time required to repair or maintain aircraft. Training is the key to limiting performance degradation. Thoroughly trained personnel can perform most required tasks while wearing MOPP4 gear.

(1) Vision. Use of the M24 protective mask reduces the peripheral vision of aircrews. To overcome this limitation, aircrews must continuously scan in all directions. The normal range of motion for the head is 90 degrees from either side of the centerline. The mask limits this 180-degree range to a 140-degree range. Therefore, aircrews must turn their heads to scan and compensate for the lost visual range. The mask also blurs or distorts the aircrew's vision in the cockpit, especially during night operations.

(2) Fatigue. Each crew member must become familiar with the symptoms and causes of fatigue. To become more aware of these symptoms and causes, aircrews can refer to FM 1-301.

d. Collective Protection. Collective protection shelters are designed to keep out unfiltered outside air by means of positive overpressure. Personnel inside this shelter do not have to wear CB protective equipment. In a contaminated environment, either a shelter or clean terrain is needed for long-term rest and relief such as sleeping, showering, eating, or shaving. The continued integrity of the shelter depends on personnel following entry and exit procedures closely. The shelter becomes worthless if contamination is tracked in or carried in. Aviation forces are widely dispersed while operating throughout the battlefield. Therefore, they must carefully evaluate the number and placement of shelters. Shelters that belong to supported units may be unable to accommodate aviation personnel. Therefore, their use by aviation elements must be coordinated. FM 3-4 describes collective protection shelters and their operation, including entry and exit procedures.

e. Protective Actions.

(1) Aircraft protection while parked.

(a) Aircraft on the ground must be protected from strong winds. In a high-nuclear-threat environment, aircrews should park aircraft inside natural revetments, bunkers, barricades, or man-made structures and then tie down the aircraft. Aircraft should also be covered as much as possible to protect them from toxic rain. Intelligence personnel can estimate what areas

are likely to be targeted. When friendly nuclear strikes are planned, information on ground zero is given.

(b) Blast is not strictly an LOS hazard as is thermal radiation. The blast wave bends around obstacles and rolls over hills in the same manner as normal winds. However, the reverse slope of a hill may substantially lessen the effect of winds. Just because an explosion cannot be seen from behind a hill does not mean the blast wave will not affect that location. Aircraft cannot be effectively protected from the overpressure. Taping the windscreen may help, but it is not effective against higher pressures.

(2) Aircraft protection during terrain flight.

(a) Aircrews can take several immediate actions to protect aircraft during a nuclear attack. When a nuclear detonation occurs during the day, the aircrew will not immediately know the yield or distance. At night, the aircrew may become blinded. Immediate action depends on whether the aviator is blinded. During the day, flash blindness is not likely unless personnel actually focus on the fireball. At night, however, the risks of flash blindness are substantial.

(b) For friendly nuclear strikes, aircrews should mark the areas on a map during premission planning so that they can stay outside minimum safe distance limits. However, once a nuclear detonation occurs, aircrews will have no indication of who fired it. When a nuclear detonation is observed, the rotary-wing aviator in terrain flight should turn away from the fireball immediately and land the aircraft as soon as possible. Even though nuclear detonation will be visible, the aircraft may not be within range to receive severe damage. Therefore, an aviator probably should not land immediately in the trees unless nearby landing areas are unavailable.

(c) The aviator has to make a split-second decision upon sighting the fireball. By immediately turning the aircraft away from the fireball, the aviator increases his chance of survival. Also, the missile effect on the Plexiglas is less hazardous to the aircrew because it travels away from the cockpit. In addition, the airframe provides protection from external missiles. After landing the aircraft, the aviator and crew should remain inside because the aircraft offers some shielding against radiation. The aviator should keep the aircraft on the ground for several minutes to ensure that either the blast wave has passed or the aircraft is far enough away to be unaffected by the blast. The positive and negative phases of the blast will occur about the same time. Therefore, the aircrew should wait until debris stops falling before exiting the aircraft. After checking the airframe to ensure it is not damaged structurally, the aircrew can continue the mission.

(d) At night, 10-second flash blindness can occur at distances beyond the range of any other effect, including EMP. For large yield nuclear detonation, flash blindness can occur at the horizon. It will occur before individuals know they have retinal burns. For rotary-wing aircrews, protective measures are limited. However, when the aircrew wears the AN/PVS-5 that

fits flush against the face, the amount of light that can enter around the device is reduced. Also, another protective measure is for one aviator to wear an eye patch over one eye. When either the AN/PVS-5 or the eye patch is worn, one aviator should have enough vision to land the aircraft. For the first few seconds after an aviator removes either the AN/PVS-5 or the eye patch, his immediate action is to gain altitude. (This is the same immediate action prescribed for night vision device failure.) If the aviator is able to see, he should land the aircraft in the nearest suitable area. If the aviator is wearing no protection, he must immediately determine his vision limitations. If the aviator has little or no vision, then he should gain altitude and attempt to wait until his vision returns. If the aviator has some peripheral vision, he should use night vision techniques to scan the area.

(3) Aircraft protection during cruise altitude. At night or during the day, aviators have the best chance of survival if they turn the aircraft away from the point of detonation and gain altitude. They should also protect their face and neck from Plexiglas fragments. In rotary-wing aircraft, aviators may be able to gain time until their vision returns. Nuclear detonations will probably affect Threat electronic air defenses. Placing distance behind the point of detonation and the aircraft and gaining altitude will lessen the damage from the blast. If detonations are multiple, then the aviator can estimate the direction of the largest or closest detonation. Turning the aircraft away from the detonation will lessen the possibility of thermal radiation damage to the eyes. After the blast wave passes, the aviator should decrease altitude and attempt to estimate damage by control feedback. If the aviator suspects damage, he should land the aircraft as soon as possible and inspect it.

(4) Equipment protection against EMP. Equipment may be protected against EMP, but this protection must be installed by the manufacturer. Field-expedient methods of wrapping equipment in foil or burying it are not feasible. If electronic components have been EMP-hardened by the manufacturer, maintenance crews must be careful not to degrade this protection. Electrical equipment that meets specifications for protection against lightning strikes is not necessarily guarded against EMP, but any protection may help. Lightning strikes in milliseconds, whereas EMP effects occur in only nanoseconds (billionths of a second).

Section VI

DECONTAMINATION

E-21. DECONTAMINATION FUNDAMENTALS

a. In the past, Army doctrine dictated that when a unit became contaminated, soldiers stopped fighting, pulled out of battle, and found a chemical unit for the cleanup. This process was time-consuming and not tactically or logistically feasible. With the Threat's capability to contaminate large areas of terrain, a contamination-free environment after every

chemical attack is impracticable if not impossible. Today's emphasis is on "fighting dirty" and conducting hasty decontamination along with natural weathering to reduce chemical or biological hazards.

b. The four principles of decontamination are--as soon as possible, only what is necessary, as far forward as possible, and prioritized. The commander uses the factors of METT-T and some additional considerations to determine when, where, and how to conduct decontamination. When planning operations, commanders should consider the following:

- Length of time that personnel have been operating in MOPP gear.
- Those missions that are planned in contaminated areas.
- The capabilities of NBC personnel and the decontamination team.
- The external support that is available from chemical units.
- The decontamination support that the supported unit will provide.
- The separated elements that must also receive support.

E-22. DECONTAMINATION LEVELS

Figure E-2 shows ground and aircraft decontamination levels. Unit personnel conduct basic skill tasks and hasty decontamination, whereas a chemical decontamination unit usually conducts deliberate decontamination. Although hasty decontamination reduces the hazard level, personnel must still use protective equipment. The goal of deliberate decontamination is to reduce the hazard level to a point where protective equipment is no longer required. When the tactical situation permits, deliberate decontamination may be performed during unit restoration operations in the rear area. Chemical decontamination units establish deliberate decontamination sites, and the supported unit assists in the operation. FM 3-5 describes decontamination techniques in detail.

E-23. AIRCRAFT DECONTAMINATION

The sensitivity of aircraft components to caustic solutions has necessitated the development of special decontamination procedures. Commanders must combine these special procedures with decontamination principles and determine where and when to conduct decontamination operations. Spot decontamination is the most cost-effective technique and will limit the spread of agents. Units may find that deliberate aircraft decontamination is not cost-effective when aircraft are in great demand. Because aircrews fly in MOPP4 gear, commanders must compare how decontamination versus no decontamination will affect the mission.

DECON TYPES	GROUND FORCES	AVIATION FORCES
Basic Soldier Skills	Skin Decon Personal Wipedown Operator Spraydown	Skin Decon Personal Wipedown Aircrew Spot Decon*
Hasty	MOPP Gear Exchange Vehicle Washdown	MOPP Gear Exchange Aircraft Washdown*
Deliberate	Detailed Troop Decon Detailed Equipment Decon	Detailed Troop Decon Detailed Aircraft Decon*

*Aviation decon techniques substituted for ground forces decon techniques.

Figure E-2. Ground and aircraft decontamination levels

a. Decontaminants.

(1) Only approved cleaning compounds may be used to decontaminate aircraft. Caustic decontaminants, such as DS2, STB, bleaches, or sodium hypochlorite, are not considered safe. DS2 corrodes rubber or plastic components and Plexiglas, and STB corrodes aircraft skin and metal components.

(2) Soap and water, kerosene, JP4, and diesel fuels are approved as decontaminants on selected parts of aircraft. JP4 is effective in removing some agents from aircraft skin and components. However, it does not neutralize the agents. Personnel must use care when handling JP4. When using a cloth soaked with JP4 to wipe contaminated areas, personnel must avoid wiping internal components near the exhaust. If water is available, personnel should use it to rinse off the JP4.

(3) When components are removed from the aircraft for repair, some contamination may remain. Personnel must decontaminate these components before cannibalization or overhaul. Once components have been decontaminated, personnel must rinse the components thoroughly before they are reinstalled on the aircraft. No guidelines exist on which decontaminants can be used on specific components. However, a general rule for choosing decontaminants is to use solvents that are normally applied to that component during routine maintenance. For example, hydraulic fluid may be used on hydraulic lines.

(4) Actual flight and aeration can help decontaminate external surfaces. The wind will blow some of the agent off the aircraft skin and expedite evaporation. However, some of the agent will remain in the paint and continue to be a hazard.

(5) Personnel must be careful when using pressurized water for decontamination. Aircraft skin and internal components can be damaged by moderate to high water pressures. Personnel must follow the guidelines in the appropriate aircraft maintenance manuals. Commanders should ensure that safety, maintenance, and NBC personnel coordinate decontamination operations.

b. Decontamination Techniques.

(1) Spot decontamination. The goal of spot decontamination is to limit the spread of contaminants by removing most of them from selected areas of the aircraft. These areas are where personnel work and may pick up and spread the contaminants; for example, the landing gear, fuel ports, doors, and handholds. Either aircrews or ground personnel may conduct the spot decontamination. Fuel and soap and water are probably the most common decontaminants.

(2) MOPP gear exchange. In a contaminated environment, MOPP gear exchange and rest and relief operations must be conducted. Every soldier must know how to change his MOPP gear to survive. Aircrews are often isolated from their parent unit and may not be able to return to their unit for MOPP gear exchange. Therefore, they will conduct the exchange with units in their area of operations. When the mission allows, aircrews may return to a unit decontamination area for the exchange.

(3) Aircraft washdown. Aircraft washdown is basically the same technique as spot decontamination. However, washdown involves more detailed and time-consuming procedures for interior and exterior decontamination. Units are encouraged to develop site layouts that are appropriate for their specific missions and the terrain. In addition, chemical units should develop procedures for assisting aviation units at washdown sites.

(4) Deliberate decontamination procedures. Decontamination sites are established by chemical units, usually in the rear areas. The supported units conduct their own personnel and equipment decontamination. The chemical unit decontaminates vehicles, provides technical assistance, and supervises the entire site. Aviation units must be thoroughly familiar with their responsibilities at these sites. The supported aviation unit must coordinate closely with the chemical unit to ensure that aviators do not land contaminated aircraft in clean areas.

c. Decontamination Operations.

(1) Arming and refueling operations. Arming and refueling operations normally take place at the FARP. All areas that FARP personnel touch should be decontaminated. In most cases, these are fuel port areas.

A more detailed decontamination is required for attack aircraft because of onboard weapon systems. Personnel should be careful to not soak areas of firing systems that are sensitive to the decontaminant.

(2) Entry and exit procedures. Commanders should outline entry and exit procedures for all types of aircraft because the procedures will vary with each type of aircraft. When procedures have been established, aircrews should practice them until they become proficient. In addition, FARP personnel must become familiar with the procedures. Aircrews should signal the FARP personnel if they intend to exit the aircraft. Then the FARP personnel can decontaminate most areas that the aircrews will touch in exiting the aircraft. The crew chiefs of most aircraft can conduct decontamination with equipment from the FARP. The possibility of transferring contamination into the cockpit is increased when aircrews exit the aircraft at the FARP. Aircrews should attempt to limit the amount of contamination transfer by using contamination avoidance measures. Before entering the aircraft, aircrews should use an M258A1 kit to decontaminate their gloves and overboots.

(3) Preflight and postflight inspections. When conducting preflight and postflight inspections on contaminated aircraft, aircrews must try to avoid becoming contaminated themselves. Spot decontamination helps reduce this possibility. Decontamination of gloves and overboots after the inspections will likewise reduce the chance of transferring contaminants into the aircraft. Aircrews may need to wear wet-weather clothing to keep most of the contamination off the overgarment. Preflight and postflight inspections and decontamination operations during or after these inspections are physically demanding tasks that increase heat stress.

(4) Maintenance inspections. Personnel may conduct maintenance inspections before or after decontamination of the aircraft. Inspection crews use the decontamination techniques discussed in (2) and (3) above to avoid spreading contamination.

(5) Repair or recovery. Repair or recovery crews should be aware of the contamination level before they enter the area. Teams will evaluate the situation to determine when or if an aircraft component can undergo decontamination. Some items may be decontaminated before they are returned to the maintenance section if the maintenance area is clean. However, if the maintenance area is contaminated, decontamination should occur there. Units may be able to move clean aircraft or components into clean facilities. Likewise, units may be able to direct contaminated aircraft or components to contaminated facilities. The management of clean and contaminated areas depends on the intensity of the battle and the availability of contamination information.

(6) Cannibalization and overhaul. The same decontamination considerations of clean versus contaminated aircraft and components also apply to cannibalization and overhaul maintenance activities. Maintenance unit leaders should closely evaluate specific repairs that require a clean area.

E-24. DECONTAMINATION SITES AND LAYOUTS

Aircraft decontamination poses unique challenges to commanders. They must decide when to conduct the various levels of decontamination. Most aviation units may conduct hasty decontamination operations. They may also conduct deliberate decontamination operations if the situation requires it and time is available. Decontamination operations are normally conducted at battalion or squadron level and require an area that meets the appropriate criteria.

a. Site Selection Requirements. The decontamination area or site must accommodate the required aircraft, have a readily available water source, and allow for adequate drainage. The site should also be relatively secure but close enough to the FLOT or area of operations and FARP to facilitate a reasonably quick turnaround of aircraft. The site must have sufficient NOE routes no less than 2 to 3 kilometers from the station for entry and exit. The site must also have slope angles not exceeding the capabilities of the aircraft assigned to the unit. Tentative decontamination sites must be considered and integrated into the tactical plan as are tentative CP and FARP sites.

b. Station Layout. Any of several techniques may be used to decontaminate aircraft. An effective method is the one-step method. In this method, units are sequenced into a particular area, shut down, decontaminated, and returned to duty. The aviation battalion or squadron is responsible for selecting and securing the site as well as augmenting chemical personnel. The chemical unit is responsible for operating the site. Figure E-3 shows typical layouts of aircraft decontamination stations. After the site is selected, reconnoitered, and secured, NBC defense personnel and the supporting chemical unit jointly establish the decontamination site. The unit commander may choose to employ the tactical CP or a representative from the S3 section to supervise the operation. As each company-level or troop-level unit is sequenced through the station, the remaining assets provide security. After aircraft are shut down, the entire aircraft or specific areas are washed with hot, soapy water and rinsed. If available, hot air may be used to dry the aircraft and decontaminate the interior or otherwise sensitive areas of the aircraft. This sequence is continued until all elements have completed the decontamination. The site is then cleared, and the unit continues its mission.

c. Safety Precautions.

(1) At no time will station personnel cross in front of an aircraft that has a turret weapon system whether it is armed or not. If an aircraft has a weapon system of any type, the aircrew will ensure that the system is cleared and placed on SAFE before the aircraft enters the decontamination station.

(2) At no time will station personnel cross to the rear of a running aircraft unless a proper clearance distance from the turning tail rotor is maintained.

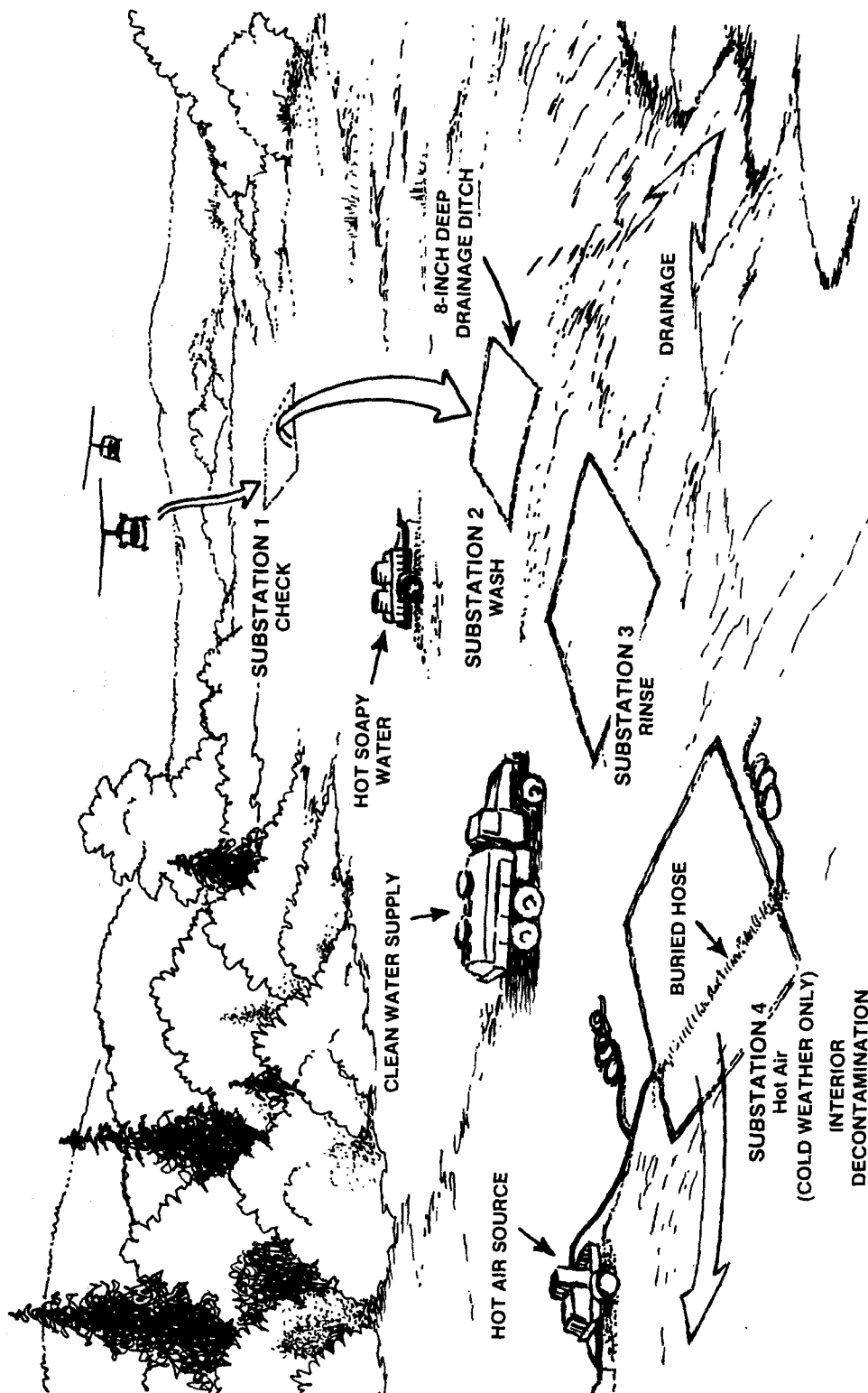


Figure E-3. Aircraft decontamination stations



Figure E-3. Aircraft decontamination stations (continued)

(3) The team leader will give all signals to aircrews. Before signaling the aircrews to move aircraft, the team leader will have visual contact with the other team member. Team leaders in each substation will wear white arm bands in the manner prescribed by the unit SOP.

d. Alternate Site Layouts. Units are encouraged to establish their own site procedures and equipment requirements. Alternate sites should be considered during the planning phase of any operation, particularly decontamination operations.

Section VII

SUSTAINED OPERATIONS

E-25. FORWARD ARMING AND REFUELING POINTS

a. Aircrew Support. Aviation units use FARPs to sustain operations. FARPs enable the unit commander to apply continuous pressure on the Threat by decreasing turnaround times and by increasing loiter times. If FARPs are near or collocated with other units that have NBC support, NBC support for the aviation elements may be arranged with those units. In a CB environment, the commander will have difficulty keeping attack aircraft in operation. However, teams of aviation assets can rotate in and out of the MOPP gear exchange or rest and relief site after several turnarounds. Clean and contaminated FARPs may be established to facilitate rapid relief-on-station operations and prevent repetitive contamination. The mission and temperature will determine how often the crews visit a rest and relief station. They can visit either before or after refueling operations at the FARP. If additional aircrews are available and the mission allows it, a crew change during rest and relief could make aircraft available for more missions.

b. NBC Planning. Detailed preplanning is the key to successful FARP operations in an NBC environment. Because FARPs are vital to the aviation mission, the issues below are included to assist commanders in planning FARP operations. General, nuclear damage, and CB contamination considerations are covered in the following issues:

- The manner by which friendly STRIKWARNs or CHEMWARNs will be passed to FARPs and to aircraft being serviced at the FARPs.
- The use of smoke to lessen FARP vulnerability during site preparation and closure.
- The training of at least one member of the FARP in the two previous considerations.
- Dosage estimates when the FARP is operating in a radiologically contaminated area; how this dosage estimate will affect operational planning.

- Awareness of FARP personnel concerning nuclear damage to aircraft. They must be able to identify nuclear damage to armament systems.
- Knowledge of FARP personnel on how to minimize nuclear blast effects and thermal damage to fuel blivets and other FARP equipment.
- Assistance of the supported or parent unit in hasty decontamination.
- Guidance to FARP ground personnel concerning the best routes through or around contaminated areas.
- Visual or radio communications that FARP personnel may use to warn the aircrew on an incoming aircraft that a FARP site is contaminated. Also, the method by which an aircrew warns FARP personnel that the aircraft is contaminated.
- In a chemically contaminated area, the individuals designated to dismount at the FARP.
- If aircrews dismount, the provisions made for spot decontamination to lessen the transfer of contamination.
- The provisions made to keep contamination (especially that carried in on boots) out of the cockpit when aircrews enter the aircraft.
- During high-sortie missions, how FARP personnel wearing MOPP4 gear can keep up with the work load; plans made for rest and relief or assistance.
- When JP4 is used as a spot decontaminant, the need for personnel to be trained in its hazards.
- The training of FARP personnel to use covers in a manner that does not create FOD hazards.
- The preparation of FARP personnel to accept supplies that are contaminated.
- The coordination and provision of personal needs for aircrews at the FARP.

E-26. AIRCRAFT MAINTENANCE

In an NBC environment, maintenance operations will be affected more by nuclear detonations than by chemical or biological agents. Nuclear detonations will cause greater structural and component damage than conventional explosions. While CB agents create a lethal environment for personnel, they do not damage aircraft components or airframes.

E-27. ARMY AIRSPACE COMMAND AND CONTROL

The control of airspace is important during a conflict just as it is in peacetime. A²C² elements must work closely with NBC elements or control centers. STRIKWARNs and CHEMWARNs may be passed through A²C² networks as well as units. NBC personnel will use NBC contamination information and friendly nuclear minimum safe distances to establish air corridors.

E-28. SURVIVABILITY

a. Radiological Contamination. A nuclear strike may cause aircraft to crash or suffer a hard landing. Surviving aircrews should be alert for forest fires or other fires caused by thermal radiation. However, radiological contamination will be the aircrew's most significant hazard. If the aircraft goes down in a fallout area or the crew receives fallout, the dose rates can be high enough to cause casualties. Each aircraft will usually have an IM93 or a DT-236/PDR-75 that measures the total dose received by the aircrew.

b. Radiological Particle Ingestion. If the situation permits, the crew should attempt to dig a deep fighting position or find cover such as a cave, an upper story of a house, or an abandoned armored vehicle. Living off the land will pose long-term hazards from the ingestion of radiological particles. The best preventive measure for this is to wash the food. Heat will not reduce any radiological hazard. Running water will dilute radiological agents and reduce the risk of drinking contaminated water. Radiation weakens the body's ability to fight disease. One of the first symptoms of radiation sickness is diarrhea.

c. Lethal Chemical Agents. In a lethal chemical environment, surviving personnel will be faced with many additional hazards. The current overgarment is not made of fire-retardant materials. When the situation permits, the crew should readjust the CB protective gear and take action to find out if the area is contaminated. They can use the M8 or M9 detection paper on-board the aircraft to identify chemical agents and the M256 detection kit to identify vapors. However, these will not detect toxins or biological agents. The crew should look closely at wildlife or population centers for evidence of lethal chemical agents. If personnel do not have another set of MOPP gear, they should not remove the gear they are wearing. If a second set of MOPP gear is available and the situation permits, the crew should change into the new clothing.

Section VIII

SMOKE OPERATIONS

E-29. SMOKE EFFECTS

Smoke is more effective when it is used at night or with natural obscurants such as fog, rain, natural dust, or battlefield dust and debris. Smoke is

the one obscurant that can be placed, within meteorological constraints, where the user wants it. Figure E-4 shows how smoke and other obscurants affect electro-optical systems.

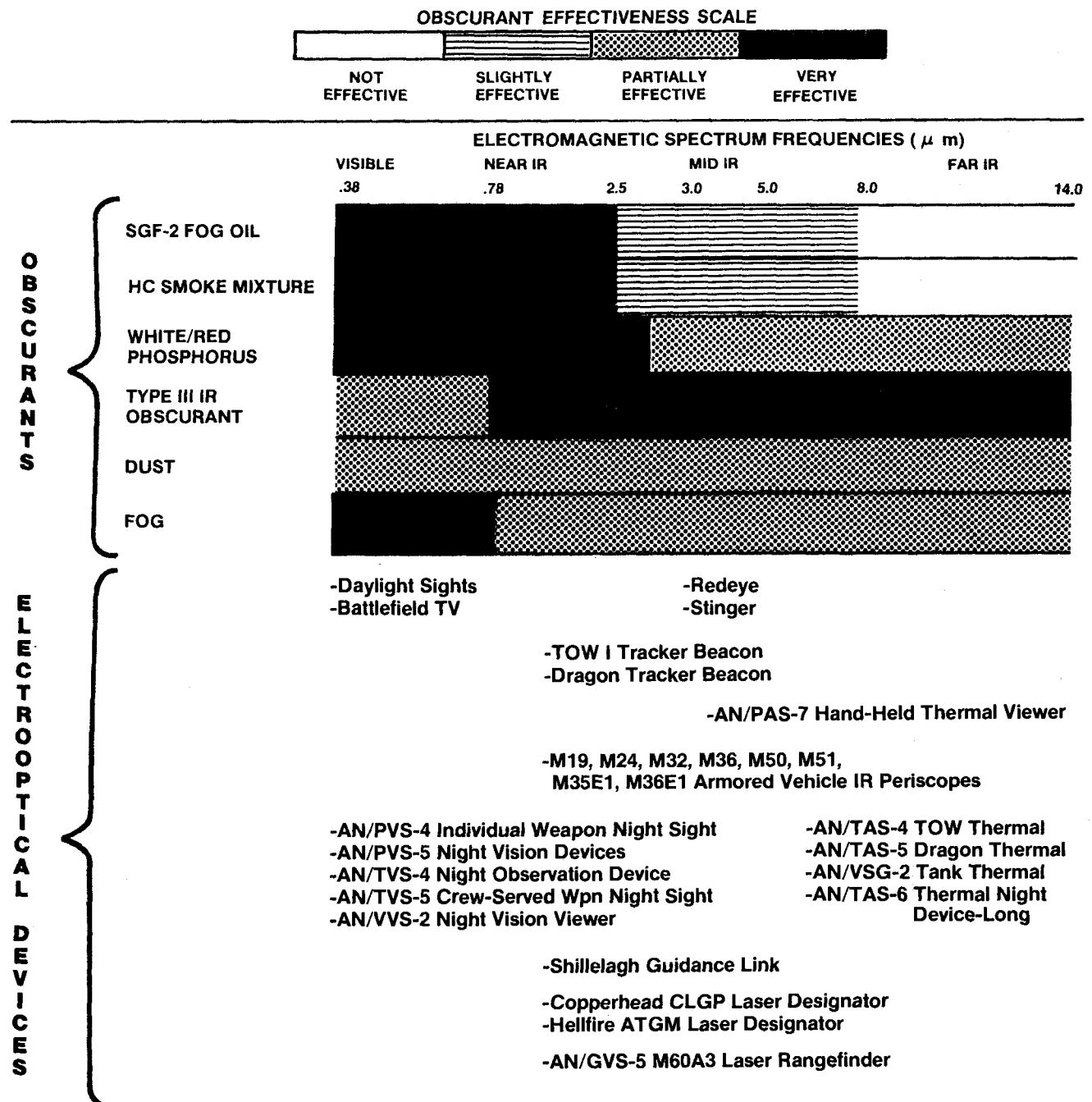


Figure E-4. Battlefield obscurants

a. Smoke is a suitable medium for hiding and dispersing CB agents. These agents may include irritants such as riot control agents, incapacitants, and other lethal CB agents. Smoke will prolong the life of CB agents

by reducing the effects of sunlight or other weather conditions on agent persistency.

b. Smoke makes it difficult for personnel to see the target. The extent of visual difficulty depends on the type of smoke used and its mixture with natural obscurants. The Soviets possess smokes that deny visual identification and adversely affect light-intensifying devices and near-infrared devices. Mid- to far-infrared devices, thermal imaging, and heat seekers are degraded when the contrast between the target and the background is reduced. The extent that a laser can be degraded depends on the energy of the laser; the lower the energy, the more the laser can be degraded. Large dust storms can adversely affect Threat acquisition systems. The Threat employs self-screening smokes during road movement.

c. Soviet doctrine regarding smoke emphasizes the employment of smoke with other decoy or deception operations. Smoke draws attention to a general area, but the observer must determine where the unit or target is in the smoke and whether the smoke really has targets.

E-30. SMOKE EMPLOYMENT

a. Threat Employment. When the Threat employs smoke against US maneuver forces, aviation missions must increase to assist with observation and command and control. When employed on terrain features, smoke can force aircraft up and into Threat air defense coverage. Smoke denies low-level corridors or possible LZs for air assault operations. Large area smoke can obscure terrain features that serve as navigational aids. Silhouetting aircraft against smoke increases their vulnerability. Smoke employed on ground-based aviation support units, such as FARPs and maintenance, will disrupt aviation operations. FM 100-2-1 provides detailed information about the Threat's use of smoke.

b. US Employment.

(1) US forces can employ smoke to keep the Threat from observing and acquiring them. For example, US forces use smoke for obscuring an enemy or for screening their units. They also use smoke for deception, identification, and signals. Properly employed smoke enhances unit survivability. Units have organic assets such as smoke pots and grenades and external assets such as artillery and generators. Large scale or sustained smoke can be employed with smoke-generating systems. FM 3-50 discusses deliberate smoke employment.

(2) When US forces employ smoke on Threat forces, their ability to observe and acquire targets will be affected. Because smoke draws attention, aircrews may tend to concentrate more on the smoke than on the targets. Aircrews may have difficulty seeing targets in the smoke or seeing targets leave the smoke. When a ground vehicle leaves a smoke screen, it is easier to acquire because it is silhouetted against the smoke. Personnel need to be aware of how smoke affects their ability to see enemy targets.

Section IX

TRAINING

E-31. AIRCREW TRAINING

Aircrew training should be conducted in two phases: the ground phase and the air phase. The ground phase acclimatizes aircrews and ground personnel to wearing MOPP gear. The air phase is more flexible; commanders must determine how much of their units' flight time they can devote to NBC training. The concepts presented here can be applied to ground crews as well as aircrews. AR 350-42 explains the unit and individual training requirements for NBC defense.

a. Ground Phase.

(1) Acclimatization must be accomplished gradually; once completed, it must be maintained. Therefore, before aircrews fly with MOPP4 gear, they should be able to operate in MOPP4 gear on the ground for at least six hours without interruption. This figure is not intended to be a limiting factor but rather a guideline for the commander. When aircrews enter into the ground phase of training, they should understand that the purpose of the training is twofold. First, it allows them to acclimatize to the protective clothing. Second, it gives them an idea of their personal limitations. For aircrews to realize their personal limitations, they must conduct the same activities they normally do in an uncontaminated environment. The commander must stress this, because all activity does not cease when the unit goes into MOPP4 gear. Normal operations include--

- Drinking.
- Map indexing.
- Flight planning.
- Preflight checks.
- Mission briefings.
- Basic personal hygiene.
- Flight clothing adjustment.
- Operation overlay construction.
- Routine maintenance such as scheduled or run-up maintenance.
- Cockpit procedures such as tuning radios, adjusting switches, or completing checklist items.

(2) As individuals progress through the ground phase, they will identify those areas that affect them the most. After determining their limitations, individuals can find new ways in which to accomplish the task or modify existing procedures.

b. Air Phase. Flight time is a valuable asset to every unit. Although the air phase can be done during existing training, a commander may find that NBC training degrades his unit's ability to accomplish the mission. General goals are recommended below, but the actual method to reach these goals is left up to the commander. The recommended goal for individuals is 6 continuous hours of operating in MOPP4 gear. The goal for units is 48 continuous hours of operating in a simulated NBC environment.

(1) For training to be realistic, commanders must rotate unit personnel, as they will in combat, through collective protection shelters. If enough shelters are available, 50 percent of the unit may be participating in rest and relief at any one time. Accordingly, unit effectiveness and mission accomplishment will be proportionally degraded. To achieve acceptable performance levels, commanders may have to move all or part of their units to a clear area.

(2) When implementing training programs, commanders should gradually increase the time that aircrews fly in MOPP4 gear over a given period. However, the training must be in line with individual crew member capabilities and safety requirements. Commanders should refer to the scheduling guide in AR 95-1 when developing crew work and rest schedules.

E-32. TRAINING CONSIDERATIONS

As with all training, the aircrew training program should be carried out aggressively, consistently, and realistically. However, commanders should remember that safety should never be sacrificed for realism. With this in mind, unit trainers and commanders must be aware of certain factors that will affect their units' success in carrying out their training program. Some factors are described below.

a. Ambient temperatures and humidity may be very high, thereby increasing the wet bulb globe temperature. Unit SOPs should specify that every soldier must be familiar with the symptoms of heat stress and other heat-related injuries. Soldiers should be encouraged to drink more water to avoid dehydration. Early morning and late evening hours are the best times to conduct NBC flight training because of the lower temperatures and decreased humidity.

b. AR 95-1 specifies the flight uniform requirements for aircrews. TC 1-210 specifies safety requirements for MOPP training. Aviators not on the controls must recognize when aviators on the controls begin to lose concentration so that they can take control of the aircraft. Every individual has a different physiological makeup; therefore, commanders should not expect every crew member to progress at the same rate.

c. Overall physical conditioning plays an important role in an individual's ability to perform in MOPP gear. Commanders should ensure that their units pursue an aggressive and challenging program of physical training along with MOPP training.

APPENDIX F

AIR COMBAT OPERATIONS

This appendix implements portions of QSTAG 768 (Edition Two).

Army aviation units, as part of theater, corps, and division aviation brigades, can operate across the entire battlefield. These units conduct air combat operations as a part of Army air defense and joint theater counterair efforts in close, deep, and rear operations. Aviation units will aggressively conduct air combat to protect themselves and other members of the combined arms team and to augment AD. Offensive and defensive air combat operations are conducted in much the same way as fire and maneuver are executed against targets on the ground. Army aviation units will conduct air combat operations mainly within the terrain flight environment. These operations will inextricably link aviation units to ground maneuver units at all echelons. By controlling the terrain flight environment, the force or ground maneuver commander can synchronize his combat activities and employ his assets at the time and place of his choosing. This appendix is a planning guide for air combat operations. FM 1-107 contains a detailed discussion of air combat operations.

F-1. PLANNING CONSIDERATIONS

Detailed air combat planning should be conducted at the lowest appropriate level. Specific planning factors and employment techniques may differ, depending on the operational area (close, deep, or rear) and METT-T. METT-T and other planning factors are discussed below.

a. Mission. The mission and the maneuver commander's intent will determine how involved the aviation unit will be in air combat. Aviation brigade elements will not serve as dedicated counterair forces but will conduct air combat operations as part of the maneuver commander's scheme of maneuver. All or part of an attack or air cavalry unit of the aviation brigade may conduct air combat as a primary mission to support an offensive or a defensive operation. Conversely, attack helicopter and air cavalry units may be tasked to perform air combat operations in a specific area or time period consistent with METT-T. Air combat planning is part of any mission planning.

b. Enemy. When planning air combat operations, Army aviation units must consider the Threat's capability to conduct ATA engagements. The aviation brigade's IPB should identify potential air threats and enemy air routes into the brigade's area of operations.

c. Terrain and Weather.

(1) Terrain. Terrain enhances the survivability of helicopters. Effective use of the terrain, therefore, is one of the keys to successful air combat. During the aviation brigade's IPB, analysis of vegetation and terrain relief will show where terrain masking and maneuver space are available.

Terrain may alter the selection of battle positions, depending on whether air-to-air or air-to-ground engagements are expected. Air-to-ground BPs are selected primarily for their range, visibility, and cover and concealment with respect to the ground engagement area. However, ATA BPs must provide ATA sectors of fire and effective overwatch.

(2) Weather. Air combat planners must consider the effect of weather on visibility, terrain, and communications. The weather affects terrain, equipment, and troops; low visibility degrades all aviation operations. Although some aviation units have near all-weather capability, low visibility degrades the speed at which these units can execute operations. It also limits the range at which they can acquire and engage Threat aircraft. Low ceilings limit the available airspace for air combat maneuvering but provide concealment from Threat aircraft. However, low ceilings also increase the probability of chance encounters. Therefore, aviation units must select BPs that take advantage of masking terrain and cover air avenues of approach.

d. Troops. The troops available determine force ratios that affect mission planning, organization for combat, and air combat execution by the aviation brigade and its elements. The types of forces available--such as AD, CAS, attack, assault, artillery, and air reconnaissance--also influence all aspects of mission planning. During the planning and allocation of combat power, division and corps commanders decide, based on METT-T, whether to assign a specified air combat mission to the aviation brigade. At the division, additional aviation forces may be requested from the corps aviation brigade because of mission requirements placed on divisional attack and air cavalry units. When tasking aviation forces with a primary mission of air combat, the maneuver commander must make a conscious decision. Without augmentation, this tasking reduces the number of attack helicopter or air cavalry assets available for air-to-ground operations as part of the combined arms effort.

e. Time Available. The available planning time determines the detail of planning and coordination for air combat. The time that operations are conducted greatly affects the survivability of aviation forces. Night operations, especially when aircraft are crossing the FLOT, enhance survivability and mission completion against sophisticated air and ground threats.

f. Other Factors. In planning for air combat, aviation commanders must consider C³I, armament and fuel, and aircraft survivability. Commanders must plan for the most efficient use of communications equipment to ensure positive command and control of their subordinate elements and the timely flow of intelligence. Although tactics will tend to be defensive when aviation units are outnumbered, aggressive offensive action is still desirable. When properly coordinated, the synchronized effort of every combined arms element and its supporting assets can overwhelm potential adversaries. Pre-mission planning should include coordination to ensure that every available asset operates in concert to defeat the Threat.

F-2. COMMAND AND CONTROL

Air combat operations require the aviation unit commander to control units that are spread laterally and in depth throughout the battlefield. Tactical flexibility is required in air combat operations. Therefore, the commander must ensure that his intelligence information is timely and accurate. He must also ensure that his intent and tactical guidance are relayed to his subordinate leaders.

a. Facilities. The commander does not need to array his C² facilities (CPs) for air combat operations differently than for other tactical operations. Air combat operations tend to be short-lived, violent, and reactive. Therefore, the commander must be flexible and act quickly and decisively; his aircraft may be the optimal location for a tactical CP.

b. Command Relationships. Air combat operations are often mission-specific and limited in function and time. Aviation units with this mission are usually operationally controlled, even when they augment other aviation units. An aviation unit with an air combat mission may be placed in varied command relationships. These are described below.

(1) Division. At the division, the aviation brigade may have units under division control or operationally controlled by maneuver units. These maneuver units may be ground brigades or the TCF for rear area missions.

(2) Corps. At the corps, the corps aviation brigade may have units under corps control or operationally controlled by or attached to the TCF. (If the TCF is an aviation unit, it will be attached.) The corps aviation brigade may have units operationally controlled by a division or a ground brigade of a division. Units may also be operationally controlled by or attached to an aviation unit in a division aviation brigade.

c. Procedures. High technology systems integrate and link aviation, AD, and other combined arms assets under one counterair umbrella controlled by the maneuver commander. The maneuver commander must synchronize his counterair assets through centralized control. However, air combat forces must retain decentralized execution so that they can use their inherent agility to defeat the air threat. Centralized control and decentralized execution are linked by thorough planning and coordination and orders that clearly express the commander's intent. Air combat battle drills, actions on contact, and rules of engagement form a baseline for the decentralized execution of defensive air combat operations.

(1) Rules of engagement are positive and procedural management directives issued by military authorities. The rules specify circumstances and limitations under which forces will initiate or continue combat engagement with encountered forces. For air combat operations, these rules may differ for Threat rotary- and fixed-wing aircraft. Rules of engagement might include the right of self-defense, hostile criteria, weapons control status, and mode or level of control. The mode of control can be centralized or decentralized. Aviation commanders should designate to what level the control is centralized or decentralized.

(2) The commander can further enhance his C² by using AD warnings to establish the readiness control levels of his units. All commanders and aircrews should be familiar with A²C² procedures. Thus they will be able to maximize the effectiveness of air combat C² without impeding the maneuver or fires of friendly forces.

APPENDIX G

JOINT AIR ATTACK TEAM OPERATIONS

This appendix implements portions of STANAG 2404 (Draft).

The joint air attack team provides the maneuver commander with a lethal combination of combat power that is highly effective against moving targets in open areas. Therefore, commanders should consider the capabilities of JAAT operations and plan to integrate them into the tactical scheme of maneuver. This appendix provides guidance for aviation brigade commanders and staffs in planning and coordinating JAAT operations.

G-1. MISSION

A JAAT operation is a synchronized, simultaneous attack by attack helicopters, CAS aircraft, and field artillery against an enemy force. The attack may be against a single enemy element or against several enemy elements in a specified area. CS for the aviation brigade comes not only from Army CS elements but also from joint and combined assets. The most prevalent of these relationships is that of tactical air, field artillery, and attack helicopters. Aviation brigades are often called on to form a JAAT while conducting their assigned missions. For subordinate units of the aviation brigade, a JAAT is nothing more than a normal mission with additional CAS. The addition of CAS provides both attack helicopters and CAS aircraft with greater survivability. The JAAT may operate as an integrated member of the combined arms team, as a reinforcement for ground maneuver units, or as an independent force. In any case, it supports the commander's ground maneuver plan throughout the battlefield.

G-2. FORCE COMMANDER'S RESPONSIBILITY

The force commander (the aviation brigade commander, the brigade commander responsible for the sector, or a higher level commander) is responsible for planning and coordinating JAAT operations. The force commander synchronizes the JAAT into the battle and brings its combined fires into play at the decisive moment. The JAAT attacks the same type of targets as the ATKHBs. The JAAT, however, has greater combat power. It can overwhelm a small enemy force or attack a large enemy force. JAATs are used to reinforce cavalry or reconnaissance squadrons in their counterreconnaissance role. To plan for and coordinate the JAAT, the commander relies on his S3, TACP, FSO, and the commander or LO from the aviation element involved.

G-3. COMPOSITION

a. Scout and Attack Helicopters. The attack helicopter portion of the JAAT consists of attack aircraft and aeroscouts from the ATKHB, cavalry squadron, or air reconnaissance squadron. These aviation units conduct missions as they normally would except for the additional planning and

coordination required for joint operations. When conducting JAAT operations, ATKHBs operate slightly different from cavalry and air reconnaissance squadrons.

(1) All members of the JAAT team (ATKHB, FA, and USAF) participate in planning the operation. Even though the ATKHB and FA provide suppressive fires against enemy ADA, the primary armor killers are attack helicopters and CAS aircraft. The size of a JAAT depends on the commander's analysis of METT-T and the number of CAS sorties allocated. A JAAT may be one ATKHC with two sorties of CAS aircraft, the entire ATKHB with one ATKHC attacking with CAS support, or another combination.

(2) Cavalry and air reconnaissance squadrons use JAATs to increase their organic antiarmor firepower. During JAAT operations, they plan and coordinate attacks and provide SEAD for the attacking CAS aircraft and attack helicopters. Attack helicopters from cavalry and air reconnaissance squadrons mainly provide SEAD, leaving CAS aircraft for the armor-killing role. JAATs involving cavalry and air reconnaissance squadrons are normally small (troop or scout-weapons teams). However, all troop or squadron aircraft may attack enemy reconnaissance elements across a wide front or engage the leading elements of the enemy's main body.

b. TACAIR. TACAIR fighters that normally provide CAS include the A-10, A-7, F-4, and F-16. The A-10 offers several advantages over other aircraft assigned the CAS mission. The A-10 was designed to conduct CAS missions, and A-10 pilots routinely train with Army aviators in JAAT operations. The relatively low operational speed of the aircraft enables the pilot to visually acquire and discriminate among ground targets. An A-10 can loiter for extended periods, make multiple attack passes, and react quickly to a changing attack plan. While the A-10 is the predominate CAS aircraft performing JAAT operations, A-7s, F-4s, F-16s, and possibly F-111s may be tasked to perform the missions. These aircraft operate at much higher speeds than the A-10; therefore, visual target recognition will be degraded. However, A-7s, F-4s, F-16s, and F-111s also bring advanced fire control avionics and laser-guided munitions capabilities to the battlefield. Because these aircraft have much shorter loiter times than the A-10, more coordination is required between the aviation commander and the TAC(A) to ensure a successful operation.

c. Fire Support.

(1) Indirect fire support is an important part of the JAAT. Fire support is normally used to begin the attack. It suppresses or destroys enemy ADA and creates confusion within the C² of the element under fire. It also forces armored vehicles to "button up" and reduces their visibility. The JAAT obtains FA support from various sources. When operating for the division or corps, the JAAT obtains FA support from the GS FA unit supporting the forces as a whole. When operating with a ground brigade, the JAAT obtains FA support from the FA battalion in DS of the brigade. FA support for a JAAT may come from an FA battalion or battery temporarily dedicated to the JAAT mission.

(2) If the aviation element does not have an FSO, fire support planning is performed by the echelon that plans and coordinates the JAAT operation. Normally, the battalion or squadron FSO supports the aviation element involved in the JAAT. The FSO works closely with the USAF TACP so that fire support fits smoothly into the plan. (The TACP is located at a ground maneuver brigade, a division, or a corps headquarters.) When the JAAT mission is underway, the aviation commander or aeroscout works directly with the FSO to coordinate continuous fire support. When the aviation commander is unable to contact the FSO directly, he may request that an AFSO in an OH-58D be attached to the JAAT to act as the FSO. He may also request support from a FA unit that is dedicated to the JAAT mission. If the battalion is conducting operations with a ground force, the aviation commander may use a ground company's FIST chief to control artillery fires and to add the fires of the ground unit's mortars as well.

G-4. PLANNING CONSIDERATIONS

Planning for JAAT operations must be coordinated among all members of the JAAT. However, the aviation brigade is chiefly responsible for overall planning according to the commander's scheme of maneuver and the allocation and coordination of assets. Subordinate members or participants refine the planning and preparation of the JAAT operation and then execute it.

a. The aviation brigade commander designates or allocates aviation forces that will participate in the JAAT operation. The S3 (Air), under the direction of the S3, coordinates allocation. The S3 (Air) plans and requests the use of tactical air assets. He also coordinates with the subordinate aviation commander, the TAC(A), and fire support assets. The aviation brigade must provide fresh and detailed intelligence information such as IPB products. Specifically, the S2 provides likely avenues of approach, engagement areas, and locations of targets for SEAD operations. He prioritizes targets for jamming or disrupting communication and radar systems. If allocated, the aviation brigade FSO determines the availability, roles, and positioning of fire support assets for the JAAT. He also provides fire control measures, communication procedures, and procedures for the use of fire support assets to the other members of the JAAT.

b. The FSO develops and publishes the SEAD plan in coordination with the brigade S3 and fire support and tactical air support personnel. The AD LO or NCO assists in identifying friendly air routes for tactical air and aviation forces. He also provides the disposition, location, and status of friendly AD systems. The TACP coordinates with the FSO and the AD section to develop control measures for USAF assets. These personnel assist the TAC(A) in positioning tactical air assets at the appropriate location and in handing over the assets to the aviation commander conducting the JAAT.

c. Most of the planning and synchronization for JAAT operations occurs at the aviation brigade TOC. Contingency operations must be considered in anticipation of a mission change during the JAAT operation. Although the success of a JAAT operation depends mostly on how well the subordinate elements prepare and execute the JAAT, planning is equally important. In the planning role, the aviation brigade staff is vital to the JAAT operation.

Planning at the joint air attack team and battalion and squadron level and the preparation and execution of JAAT operations are described in FM 1-112 and TRADOC TT 17-50-3.

G-5. OPERATIONS

a. Preplanned. A preplanned request for a JAAT is made when time is available to request CAS, using a formal preplanned format. The FSO, in coordination with the TACP at a brigade or division, drafts the request and passes it through Army channels to the corps. The corps FSE transmits the request to the BCE at the TACC in the tactical USAF headquarters. TACC personnel then process the request according to priorities selected by the land component or joint force commander.

b. Immediate. An immediate request for TACAIR is sent through USAF channels when the requirement is urgent and time is not available to process a preplanned request. The USAF TACP transmits the request directly to the corps ASOC, using the USAF air request net. The TACP at the intermediate-level headquarters monitors the transmissions and advises the intermediate-level Army commander of the request. The intermediate-level commander may have other assets available or choose not to honor the request. He uses the TACP to relay a disapproval to the ASOC and the requesting subordinate unit over the USAF radio net. Silence on the part of the intermediate-level commander is considered as approval at the corps. After the corps TOC validates the requirement, the ASOC fulfills the support request by using assets held on strip or airborne alert or by diverting aircraft from other missions.

G-6. EMPLOYMENT METHODS

Employment of the JAAT is METT-T dependent. The method of employment is decided as early as possible to coordinate the attacking assets. The basic employment methods are sector attacks and combined attacks. In sector attacks, each element of the JAAT attacks within a specified sector. In combined attacks, JAAT elements mass their fires by attacking the same sector.

a. Sector Attacks. During sector simultaneous attacks, each JAAT element maneuvers to attack within its assigned sector and engages targets at the same time as other JAAT elements. All aircraft must coordinate ordnance fans and avoid fragmentation. In sector sequential attacks, each element maneuvers within its assigned sector to attack in a predetermined sequence. The sequence interval may range from several seconds to several minutes. This option reduces the problem of ordnance fan coordination and expedites covering fire for each preceding element. During sector random attacks, each element maneuvers to attack within its assigned sector and engages targets at will. Again, ordnance fan coordination is necessary to ensure fragmentation avoidance because attacks may inadvertently become simultaneous.

b. Combined Attacks. During combined simultaneous attacks, all JAAT elements engage targets in the same sector and attack at the same time. Each element must coordinate its ordnance fans and avoid fragmentation. In combined sequential attacks, all elements engage targets in the same sector and

attack in a predetermined sequence. The sequence interval may range from several seconds to several minutes. This option reduces the problem of ordnance fan coordination and expedites covering fire for each preceding element. During combined random attacks, all elements engage targets in the same sector and attack at will. Again, ordnance fan coordination is necessary to avoid fragmentation because attacks may inadvertently become simultaneous.

APPENDIX H

ARMY AIRSPACE COMMAND AND CONTROL

This appendix implements portions of STANAG 3805 (Edition Two).

On future battlefields, aviation brigade commanders will conduct a variety of maneuver, CS, and CSS missions within heavily congested airspace. The command and control of Army airspace promotes safe, efficient, and flexible airspace use. Airspace above the corps area but below the coordinating altitude is designated the Army airspace control subarea by the airspace control authority. This airspace is managed by maneuver unit commanders. Airspace management coordinates, integrates, and regulates the use of airspace of defined geographical and altitudinal dimensions. The command and control of airspace must contribute to the overall operational plan. This appendix is an overview of airspace C². Aviation brigade and subordinate commanders and their staffs can use it as a planning guide. FM 100-103 contains more information on Army airspace command and control.

H-1. A²C² LINK

The aviation brigade commander must coordinate the employment of his assets according to the airspace command and control plan. To minimize the risk of engagement by friendly AD forces, the commander must use the existing C³ structure and require his forces to adhere to directed control procedures. The commander must ensure that a strong link is established and maintained with A²C² elements at division, corps, and EAC. Thus information that affects users of the theater airspace can be rapidly disseminated.

H-2. A²C² ORGANIZATION

a. The A²C² system is linked with the ACA, who is the commander designated to assume overall responsibility for operations of the airspace control system in the airspace control area. Normally, this ACA is the senior USAF commander in the theater of operations. The A²C² system is linked with the ACA by communications, standardized procedures, acquisition systems, and liaison. This combination constitutes the theater integrated airspace control system.

b. Army units within the theater of operations differ in their organizational structure. These units range from maneuver battalions to the senior Army operational headquarters or land component commander. Therefore, staff sections and liaison elements from which the A²C² element is organized vary in personnel, grade structure, and equipment authorizations. The A²C² element is created out of the principal staff sections and liaison elements that represent the major functional users of airspace. The G3 organizes the A²C² element, which normally includes the G3 section (G3 Air), fire support section, aviation section, AD section, ATS facilities, and ALO.

H-3. STAFF RESPONSIBILITIES

Personnel from the sections and elements assigned A²C² staff responsibilities accomplish two separate tasks. First, they assist the echelon commander in properly applying their parent unit's assets, provide the necessary functional area expertise, and serve as liaison between the commander, his headquarters, and their parent unit. Second, they assist in the A²C² process by synchronizing the airspace requirements of the parent units with other airspace users of the combined arms team and services. The A²C² elements--

- Identify and resolve airspace user conflicts.
- Maintain A²C² overlays and information displays.
- Develop A²C² procedures, plans, SOPs, and annexes.
- Coordinate and integrate airspace user requirements within the area of operations.
- Coordinate Army airspace use with other components of the joint force and with adjacent units.
- Advise subordinate and higher headquarters of significant activities affecting airspace use.
- Advise subordinate and higher headquarters of the impact of airspace control measures or restrictions on land operations.
- Approve or staff requests for special-use airspace.

H-4. A²C² ELEMENTS

Designated A²C² elements are collocated with the fire support cell at the main CP from division through the senior land force headquarters. EAC, corps, and division aviation brigades have dedicated TOE personnel to accomplish the required A²C² functions. The A²C² representation provided from the aviation brigade consists of an airspace management officer, an operations sergeant, and a flight operations specialist. No formal A²C² element is established at the tactical CP. Therefore, airspace control functions are accomplished by designated representatives from selected staff and liaison elements. At a minimum, these personnel include a G3 assisted by an FSO, an aviation representative, and a USAF liaison officer. The G3 is responsible for the A²C² effort. Coordination is maintained between the tactical CP and A²C² element at the main CP to ensure that airspace requirements generated by changes to the tactical situation are met in a timely, effective manner. These A²C² elements form a vertical and horizontal channel through which airspace information and requirements are coordinated and disseminated.

a. EAC A²C² Element. The A²C² element for EAC is located at the senior Army operational headquarters. It operates under the staff supervision of the Deputy Chief of Staff or G3, or it may operate under the Joint Chiefs of Staff or J3, Operations (joint force). The element consists of

representatives from AD, Army aviation, USAF air support coordination element, fire support, ATS, and G3 operations. It also consists of representatives from the DCofS, G2; DCofS, G4; and, when required, the air and naval gunfire liaison company. Under the supervision of the G3, the A²C² element publishes the theater airspace management plan. It integrates the C² of theater airspace with the USAF TACC through the Army battlefield coordination element located at the TACC.

(1) The land component commander coordinates airspace control within the theater of operations for those requirements that overlap the rear CZ and COMMZ. He plans and executes ground combat operations and C² and A²C² for assigned forces. Within a US unilateral theater, a BCE is established at the TACC to coordinate and integrate land and air operations. The theater army LCC's guidance and intent are communicated to the TACC by the BCE. At the LCC level, the G3 receives airspace control requirements from A²C² elements within each CP. He then coordinates them through the BCE to the airspace planners of the tactical air force.

(2) The TAF airspace planners define the broad policies and procedures for operating the integrated airspace control system. As a theater is maturing, the growing complexity of combat operations and changing support force structure may result in the organization of an army group headquarters. If the army group commander is designated as the LCC, he commands, guides, and directs the BCE. Military operations may dictate a requirement to employ an intermediate headquarters (a field army) subordinate to the theater army. This field army will be responsible for the operational and tactical direction of the corps. When designated as the LCC, the field army commander works closely with the ASCE to coordinate all land force air support requirements. The LCC coordinates SEAD operations with senior and subordinate echelons or directly with the BCE.

(3) Within combined theaters, such as the European theater, the airspace C² organizational structure changes to include an allied tactical air force. The ATAF headquarters is organized to perform the airspace C² functions normally performed at the air component commander level. Those functions normally accomplished within the TAF are performed at the ATAF level. The functions include the development of the theater (joint force) airspace control plan and airspace interdiction, AD, intelligence, and counterair procedures. The theater of operations has been further divided into three regions: northern Army group, central Army group, and southern Army group. Each region has its respective ATAF to plan and establish airspace policies and procedures for conducting combined operations. The allied tactical operations center collocated with the ATAF performs the operational and air support coordination functions of the TACC. ATOC includes a ground liaison team that assists in coordinating AD and airspace control matters normally accomplished within the BCE of the TACC.

b. Battlefield Coordination Element. The land (Army) component's BCE, located at the TACC and commanded by the senior operational Army commander, establishes priorities for the air effort. An A²C² element representing the LCC is located in the BCE. Under the current TOE, the BCE is authorized three officers and three NCOs for the AD and A²C² sections. One officer and

one NCO are allocated for A²C² functions. With only two personnel authorized, the A²C² section requires additional personnel to sustain 24-hour operations. Other sections of the BCE located with the offensive air section may provide these personnel. Information on all requests for control measures and restrictions are provided from the appropriate A²C² elements (EAC or corps) to the BCE for coordination within the TACC's airspace control center. AD and USAF operations are coordinated to prevent mutual interference, exchange intelligence information, and ensure the safety of friendly aircraft.

c. Corps A²C² Element.

(1) The corps A²C² element coordinates, integrates, and regulates corps airspace. This element is located at the corps main CP. It consists of representatives from selected staff sections and liaison elements; for example, the G3 section, AD element, aviation element, FSE, USAF TACP, G2 CM&D section, G4 section, ANGLICO, and supporting ATS platoon. The corps A²C² element--

- Coordinates and integrates airspace use.
- Maintains A²C² overlays within the main CP.
- Develops and maintains the airspace utilization map.
- Approves or staffs requests for special-use airspace.
- Identifies and resolves conflicts between airspace users.
- Develops plans, procedures, and SOPs and disseminates them to appropriate agencies.
- Advises higher headquarters and subordinates of significant airspace activities and how airspace command and control will affect operations.

(2) At the main CP, the A²C² element is under the supervision of the G3 Air (corps A²C² officer). The element accomplishes all airspace control functions related to corps rear and deep operations and the plans for future operations. The corps A²C² element is collocated with the fire support cell and is near or electronically connected to the ASOC. This expedites continuous coordination should a fast-reaction capability be needed to satisfy immediate requests from Army forces for tactical air support. The element is equipped for secure communication with the tactical and rear CPs and has record traffic capability. The element is linked to the maneuver control system through the G3 Air tactical computer terminal. The terminal has additional work stations for the ATS, fire support, and AD representatives.

(a) During sustainment operations, the A²C² element works with the CSS cell at the main CP and the staff at the rear CP to satisfy airspace control requirements. Operations, such as USAF airlift missions, require

extensive coordination with other staff officers; for example, the corps movement officer, transportation officer, and tactical airlift officer.

(b) During rear operations, the A²C² element at the main CP and the operations and intelligence section of the rear CP monitor changes in the tactical situation. Tactical changes may require changes to airspace control measures established in the rear CZ.

(3) The corps A²C² element is represented at the tactical CP by an FSO, an aviation officer, an AD officer or NCO, and an ALO from the TACP. The element may be augmented from the corps main CP to conduct 24-hour operations. The responsibilities of the corps A²C² element should be limited to monitoring current operations. The element maintains coordination with the main CP so that airspace requirements generated by changes to the tactical situation are met in a timely, effective manner.

d. Division A²C² Element.

(1) The division A²C² element in the division's main CP coordinates, integrates, and regulates division airspace. Aviation representatives of the division A²C² elements are assigned to the aviation brigade, but they function as part of the division staff. Within the tactical and main CPs, the organization and location of the A²C² elements are similar to those of the corps. The division A²C² element--

- Develops and maintains the airspace utilization map.
- Coordinates USAF tactical airlift airspace use and information.
- Identifies and resolves potential conflicts in the use of airspace.
- Disseminates information concerning enemy AD activity to all aviation units.
- Monitors and advises the commander on the status of AD and aviation assets.
- Coordinates selected identification requirements and IFF procedures for Army aircraft.
- Coordinates and disseminates information about and changes in coordinating altitudes.
- Coordinates requirements for flight plans, restricted areas, AD, and aircraft weapons-free zones.
- Maintains and disseminates the status and location of NAVAIDs, LZs, and PZs in the area of operations.
- Coordinates requirements for airfield terminal control zones with the flight coordination center element and the corps A²C² element.

- Coordinates and disseminates ATS and AD procedures to be used by aviation units for cross-FLOT operations, to include return procedures.
- Develops, maintains, and disseminates recommended low-level transit routes and minimum-risk routes throughout the division area of operations.
- Maintains and disseminates information about all restricted operations areas and zones, SAAFRs, WFZs, flight corridors, and refueling point locations and status.
- Maintains and disseminates information about significant preplanned FA fires, nuclear strikes, CAS strikes, USAF and Army reconnaissance missions, and major air assault operations.
- Establishes and maintains a standard-use Army aircraft route system throughout the division area of operations. (This includes instrument recovery routes for each brigade area to recover aircraft that inadvertently fly into IMC. A full-strength ATS platoon can support up to two precision terminal approach sites in the division.)

(2) The division rear CP has no A²C² representation. Airspace control functions are handled by the A²C² element located within the main CP. Should the tactical situation dictate, the main CP may displace A²C² personnel to the rear CP to accomplish any required airspace control functions.

(3) The division A²C² element develops the division A²C² OPLAN. The plan details airspace management functions and specifies SOPs, restrictive measures, and coordination and ATS information requirements. It incorporates applicable elements of the corps A²C² plan and the ACA airspace control plan. The division A²C² element coordinates with the division main and rear CPs to determine which maneuver, CS, and CSS activities affect airspace management planning.

(4) The division A²C² element develops an A²C² annex for the OPLAN or OPORD and disseminates it to appropriate CPs, the FCC, and aviation brigade elements. The annex, with its overlay, includes the specific Army and joint service airspace requirements in effect for a given operation. It also outlines the commander's priority for airspace use within the division.

(5) The A²C² element uses graphic displays that combine AD, aviation, ATS, and fire support information. Data are maintained on current and planned restrictions and special joint-use requirements. The G3 resolves airspace conflicts that cannot be resolved by command guidance, orders, and SOPs. The ATS elements supporting the division provide terminal, en route, and flight-following services to aircraft flying VFR and IFR below the coordinating altitude.

(6) The FCC may be employed in the division area. If so, it provides a communications link between terminal facilities of existing airfields, other nearby airfields, division CPs, other FCCs, and the corps

flight operations center. The FCC provides flight-following as well as information on air traffic movement within its assigned area. It monitors Army aircraft operations and provides hostile activity warnings to Army aviation units operating in the airspace. The FCC also passes IFR flight plans to the airspace management center for approval and VFR flight plans to the appropriate ATS facility. The FCC establishes the necessary liaison with the AD command post. The AD unit's radars receive real-time input from associated firing units. They provide the FCC with additional low-altitude radar coverage over the division and beyond the FLOT by voice and data links through the AD system. FCC liaison with the AD CP links Army AD, Army aviation, and USAF systems.

e. Aviation Brigade A²C² Staff Element.

(1) The aviation brigade's three-person A²C² element is augmented with personnel from the brigade, as required. The element is composed of organic personnel that have other primary duties; for example, the S3 Air, FSCoord, and AD representative. However, the element represents the interests and coordinates the needs of the brigade forces as a member of the EAC, corps, or division A²C² element. Secure and nonsecure voice record copy, messengers, and host nation channels may be used for communication. The multichannel communications system, however, is the primary means of communication for this element. The aviation brigade A²C² element--

- Helps plan aviation brigade A²C² requirements.
- Keeps the S3 informed of the current A²C² situation and changes.
- Forwards requirements through the A²C² element to the J3 or G3 for approval.
- Advises the EAC, corps, or division A²C² element about planned aviation operations.
- Coordinates with other members of the A²C² element to prevent conflicts in airspace usage.
- Reviews the airspace use and Army aviation plans and graphics portion of the EAC, corps, or division OPORD or OPLAN.
- Advises the brigade commander and staff about actions required to implement and follow the required A²C² measures.
- Passes information received from other members of the EAC, corps, or division A²C² element back to the aviation brigade S3.
- Provides information to the J3 or G3 representative concerning the aviation brigade's input to the A²C² annex of the EAC, corps, or division OPLAN or OPORD.

(2) The primary A²C² function during close operations is performed at EAC, corps, and division. However, it is also performed at the brigade

because many airspace users are under brigade control. The brigade commander or his designated representative, normally the S3, is the airspace manager. The commander may form an A²C² element, but it must come from within brigade assets. The A²C² function is performed by existing staff personnel, supporting liaison representatives, and fire support representatives. The brigade commander may retain subordinate battalion A²C² responsibilities. A²C² functions are the staff responsibility of the S3; he is assisted by other staff personnel as required. These personnel include the S2, S3 Air (responsible for operations), FSO, ALO from the TACP, LOs from supporting Army aviation and AD units, and UAV unit representative, if applicable.

(3) Airspace C² is accomplished primarily by procedural communication and visual control. At brigade level, A²C² functions involve detailed coordination and integration of tactical air, indirect fire, organic AD, and tactical fire and maneuver operations. The maneuver unit commander employs, controls, and coordinates the use of airspace by forces supporting or reinforcing his operations. The commander also coordinates his airspace activities with other elements of the A²C² system.

(4) In the brigade area, air operations are conducted on a "see and be seen" basis to prevent aircraft collisions. Fire support and aviation operations are conducted simultaneously. Therefore, the S3 must ensure coordination among all airspace users to prevent conflicts in airspace usage.

(5) Aviation unit operations personnel, when possible, will provide advance entry information briefings to aircrews entering the brigade area. These briefings will include the supported or reinforced unit's tactical situation. The supported or reinforced unit (brigade or battalion) must know in advance when and where Army and other service aircraft will enter the area. Army aircraft operating in the brigade or battalion areas are routinely controlled through the chain of command. Commanders communicate directly with the supporting or reinforcing aviation unit commander to convey taskings and coordinate missions.

f. Battalion Airspace Command and Control. Within the maneuver battalion, the commander is the airspace manager. Airspace control functions are performed at the main CP by staff representatives. Normally, these representatives include the S3 or S3 Air, the TACP, and the FSO. The battalion S3 controls the use of battalion airspace.

(1) The commander and the S3 know the tactical situation, including the location and configuration of subordinate maneuver and supporting units using battalion airspace. Operations staff elements collect information to keep the commander and staff informed of potential conflicts among airspace users in the battalion area.

(2) When a ground maneuver battalion is being supported, aviation unit operations personnel will brief aircrews on the supported unit's tactical situation. When possible, the supported unit is told when and where supporting aircraft will enter its area. The air mission commander

establishes communications with the supported battalion commander. Coordination between the two units is essential to the supported battalion commander's control of his airspace.

H-5. CONTROL AND COORDINATION PROCEDURES

Priorities and planning activities of the combined force commander, together with the requirements of subordinate commanders, are brought together and presented in the operational commander's airspace control plan. The ACA coordinates with subordinate commanders to develop the ACP. The subordinate commanders then prepare detailed plans to include air tasking orders that respond to the requirements of their respective areas.

a. Airspace Control Plan. The ACA prepares the ACP, which explains the specific procedures of the airspace control system for a particular area of operations. FM 100-42 contains a checklist of recommended planning procedures for developing an ACP. Ideally, the ACP is prepared and published as a separate document such as an annex to the OPLAN. If required, it may also be distributed via teletype message or as an airspace control order. Aviation unit commanders, staff planners, and aircrews must be briefed and knowledgeable about the ACP, designated procedures, rules of engagement, and AD plan.

(1) Specific procedures. The ACP describes specific procedures for requesting and activating airspace control measures. The plan includes specific procedures for aircrews to meet friendly criteria of all friendly AD weapons when aircraft operate under procedural control. Procedures are also provided for positive control of aircraft throughout controlled airspace.

(2) Coordination. Airspace control is a compromise among a variety of conflicting demands for the use of airspace. The ACP must be planned and coordinated with representatives from all components of the joint force. It must not result in undue restrictions upon friendly forces and must remain simple to avoid confusion. Aviation commanders and staff planners must ensure that airspace control procedures prevent mutual interference, ease AD identification requirements, and expedite the flow of air traffic.

(3) Air defense interface. A limiting factor in designing the airspace control plan is the AD system. The location of AD weapon systems and fighter, missile, and SHORAD engagement zones and the unique methods of identification for each system will determine the airspace procedures for friendly aircraft. These factors provide planners with a tentative assessment of flying restrictions that determine the procedures for airspace control.

b. Air Tasking Order. The ATO is published by the air component commander, who specifies which missions will be flown and which aircraft will fly the missions. The ATO includes all jointly approved airspace control measures or restrictions. The dissemination of the ATO ensures that all airspace users have information relevant to other missions; for example, listing the SEMA mission in the ATO is one way to achieve airspace coordination. This will help ensure safety and mutual operational efficiency.

c. Planning Considerations. The A²C² elements and the current operations cell must promptly attend to matters pertaining to the use of airspace at EAC, corps, and division. At these levels, the ability of the commander to influence the conduct of the battle is largely dependent on the use of air assets. Air assets can be employed in a relatively short time, and requirements to coordinate and integrate their airspace requirements with the ongoing battle require immediate attention. A²C² elements coordinate with other staff cells within the main CP to determine which maneuver, CS, and CSS activities, requirements, and missions affect A²C².

(1) ATS data. The A²C² element maintains data on ATS facilities, current and planned restrictive measures, and special joint-use requirements. It also maintains data on the AD situation, including AD coverage for use by other TOC elements. Hostile air activity data obtained through the G2 and AD channels are provided to the A²C² element and other elements of the main CP. The A²C² element advises the commander about how the AD weapons control status will affect air operations.

(2) ATS support. The A²C² element, together with the supporting ATS unit, develops plans to provide ATS assistance to aircraft and tactical units operating within the area of operations. The ATS system supports aviation brigade units and aircraft of other component forces conducting tactical operations in the area. It also is the interface between aircraft in flight and the A²C² element at the main CP. ATS support includes navigational and flight-following assistance, air threat warnings, weather information, artillery advisories, and airfield and landing site terminal control. This support also includes other assistance as required to ensure near real-time coordination and integration of air traffic.

d. Command and Coordination. The maneuver commander manages the airspace over his area of responsibility through his staff, A²C² element or liaison officers from the USAF, AD, and Army aviation. If the commander has no dedicated A²C² element, he may form one from the AD LO, the Army aviation LO, the FSO, the ALO, and the brigade S3 Air. The LOs function as special staff officers and advise the commander and staff about their functional areas and related A²C² matters.

H-6. AIRSPACE CONTROL PROCEDURES

In future battles, Threat forces will attempt to degrade airspace control capabilities by direct attack or electronic means directed against control nodes or other specific targets. Therefore, any system of airspace control must be survivable through hardening and redundancy and must permit the effective combination of positive and procedural control measures. Airspace control procedures must include identification methods compatible with those required for AD. This will ensure the timely engagement of enemy aircraft, conservation of AD resources, and reduction of risk to friendly forces. Examples of defined airspace control measures are shown in FM 100-103.

a. Positive Control. Positive control is a method of airspace control using electronic means. It relies on detection, positive identification, and

tracking of aircraft within the airspace. A rapid, reliable, and secure means of identification is a desired objective. Normally, the electronic method is the most rapid and reliable means of identification in the CZ. Positive and continuous control of aircraft is provided by radar using IFF or SIF returns and by monitoring. Positive control is also maintained by the general surveillance of known air traffic movements by radar or other means.

b. Procedural Control and Methods.

(1) Procedural control. Procedural control is a method of airspace control that relies on a combination of previously agreed-on orders and procedures. Procedural control measures must be employed when positive control measures cannot be used or are inappropriate for the situation. Procedural controls available to the A²C² element include ACOs, special instructions in the air tasking order, and ACA techniques, procedures, and rules in the ACPs. Airspace control annexes to OPLANs or OPORDs and unit SOPs provide additional techniques for employing procedural controls.

(2) Procedural methods. Tactical operations require the commander to combine positive and procedural controls. The C² system, A²C² system, and USAF tactical air control system provide the necessary organization and facilities to exercise positive control. Joint, Army-specific airspace control measures, and standard Army operational procedures provide the necessary methods for the procedural control of airspace. The Army's airspace control methodology emphasizes the procedural control of airspace in the MBA.

H-7. AIRSPACE CONTROL MEASURES

Airspace control measures are the rules and mechanisms put into effect by joint and allied doctrine and defined by the theater ACP. Control measures are defined in general terms according to the normal use of the control measures. The precise details of control measures and their arrangement and application techniques are specified and defined by the theater ACP and ACA directives. Examples of defined airspace control measures and users of those measures are shown in Table H-1. Commanders inform the ACA of their requirements for temporary airspace control measures through the appropriate airspace control system. Aircraft requests contain a statement of requirements, which includes the location, lateral and vertical limits of the affected airspace, and time. Procedures for requesting and activating special-use airspace are described in the ACP. The A²C² element at each command echelon reviews the requests so that the measures support the commander's concept of operations. The requests are then forwarded through the operational chain. The A²C² element and staff elements within the TACC review the requests; the ACA approves airspace control. The information is disseminated to all appropriate elements of the joint force. Figure H-1 depicts the measures available to provide procedural control for airspace users. FM 100-103 contains additional information about the techniques that govern the use of airspace control measures.

Table H-1. Airspace control measures

<u>CONTROL MEASURE</u>	<u>USER</u>
<u>Corridors and Routes:</u>	
Air route	NATO/ASCC
Low-level transit route	NATO/ASCC
Minimum-risk route	US
Standard-use Army aviation flight route	US
Special corridor	NATO
Transit corridor	NATO
<u>Zones:</u>	
Base-defense zone	NATO
High-density airspace control zone	US/NATO/ASCC
Restricted operations zone	US/NATO/ASCC
Weapons-free zone	NATO
Air combat engagement areas	US
<u>Flight Levels:</u>	
Coordinating altitude (level)	US/NATO
Traverse level	US/NATO
<u>Other Airspace Subdivisions or Control Measures:</u>	
Airspace coordination area	US/NATO
Amphibious objective area	US/NATO
Terminal control area (zone)	US/NATO
Weapons engagement zone	US/NATO
Control point	US/NATO
Way-point	US/NATO
Time slot	NATO/ASCC

a. Common Control Measures.

(1) High-density airspace control zone. A HIDACZ is a defined area of airspace that reserves airspace. It allows the commander to restrict a volume of airspace from users not involved with his operations. The HIDACZ--

- Requires joint approval.
- Is requested by the maneuver commander.
- Is controlled by the requesting commander.
- Requires that users be controlled and that aircraft obtain approval before penetrating the airspace.

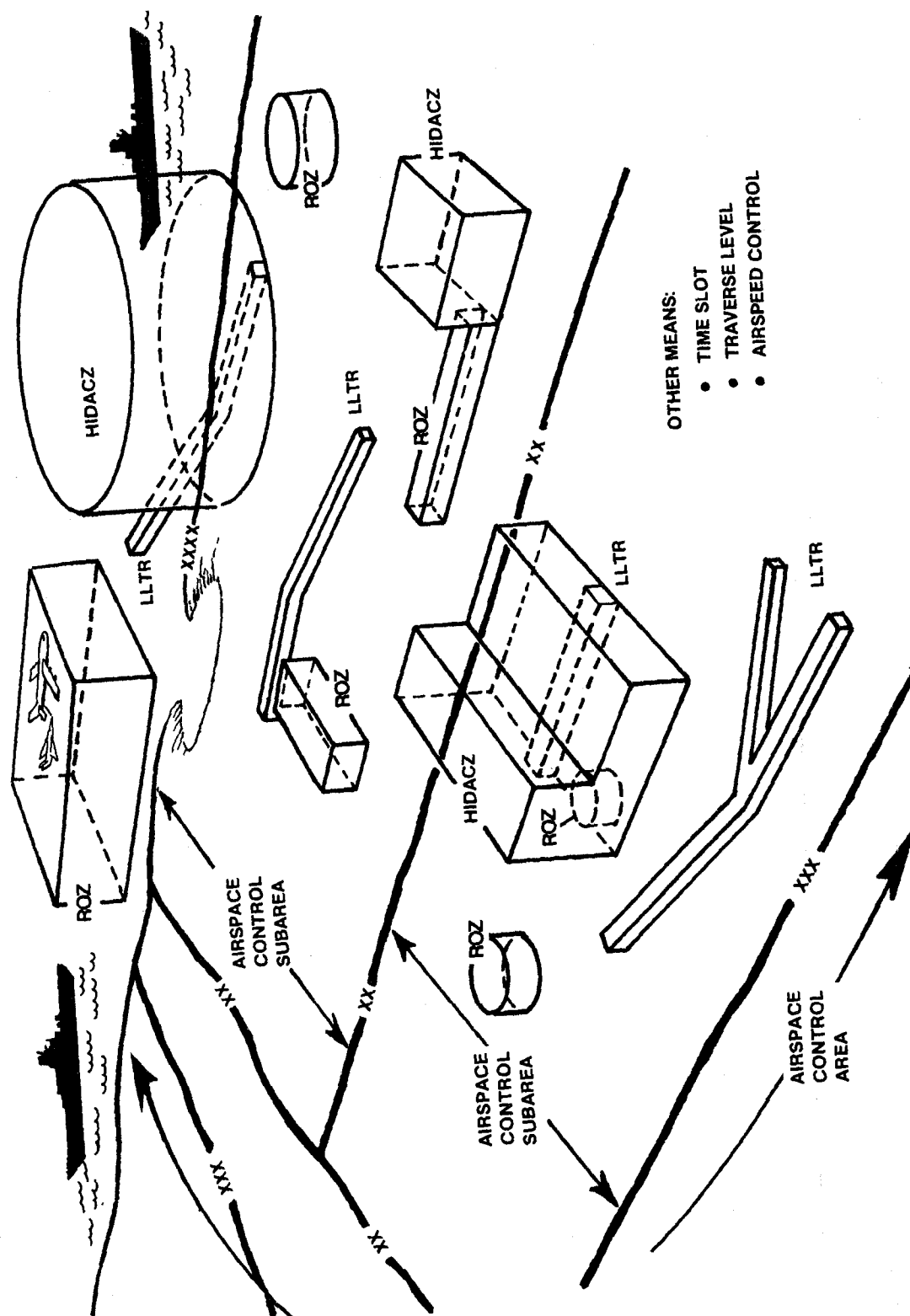


Figure H-1. Airspace control measures

(2) Coordinating altitude (level). The coordinating altitude (level) is designed to separate fixed-wing and rotary-wing aircraft. Coordinating altitudes may be designated by the ACA and are normally specified in the ACP, unit SOP, or OPORD. The coordinating altitude does not prohibit either aircraft from using airspace above or below the altitude. Before passing through this altitude, aircraft coordinate with the appropriate Army or USAF controlling agency. When an aircraft passes into the airspace above or below the coordinating altitude, control (positive or procedural) always reverts to the controlling authority for that airspace. Coordinating altitudes may be stepped down along prominent terrain features.

(3) Restricted operations zone. The terms airspace restricted area and restricted operations zone both refer to the same control measure. An ROZ is a volume of airspace of defined dimensions developed for a specific operational mission; for example, it may be established around a tactical airfield, drop zone, SAR operation, SEMA orbit, or an RPV or a UAV launch and recovery site. Requests for the establishment of an ROZ are sent by the commander through the appropriate A²C² facility to the ACA.

(4) Minimum-risk route. An MRR is a temporary flight route recommended for USAF use. It presents the minimum known hazards to low-flying aircraft transiting the CZ. The airspace control center forwards established MRRs to TACS elements, wing operations centers, and A²C² elements within the corps. The ground commander's A²C² element recommends that MRRs be updated, altered, or canceled based on changes in the tactical situation. The element also recommends that MRRs--

- Receive ACA approval.
- Extend below the coordinating altitude.
- Be designed to protect friendly aircraft.
- Avoid fire support targets, AD weapons, LZs, PZs, FARPs, and Army airfields.
- Start at the corps rear boundary and extend to the FSCL.

(5) Low-level transit route. An LLTR is a temporary bidirectional corridor through the areas of organic low-level air defenses of surface forces in a HIDACZ or an ROZ (area). It reduces the risk to friendly aircraft; it also minimizes constraints to organic air defenses in a status of "weapons free." An LLTR is changed often to prevent compromise. It will--

- Include shallow dog legs to provide surface AD cover against direct enemy penetration.
- Have a matrix of alternative route entry points forward of and turning points to the rear of the surface AD area.

- Have routing around the restricted or heavily defended areas to the rear.
- Include closing one corridor and opening an alternate one or reversing the direction of flow within each corridor.

(6) Standard-use Army aircraft flight route. An SAAFR is established below the coordinating altitude to expedite the movement of Army aviation assets. The SAAFR is normally located in the corps and division rear area. It is a recognized Army airspace control measure that does not require joint approval. The A²C² element develops SAAFRs to safely route Army aircraft conducting CS and CSS missions at terrain flight altitudes. These routes are intended mainly for single aircraft or for small flights of aircraft operating routinely between base clusters in the division support area and corps rear area. Some considerations for establishing SAAFRs are covered below.

(a) Routes in rear areas should provide terrain masking from enemy AD systems to avoid compromising the SAAFR structure and facilities of key base clusters.

(b) SAAFRs may be extended to the brigade support area when numerous logistical missions will be flown into the brigade support area or FSB.

(c) The corps A²C² element develops the SAAFR structure for the corps rear area. It also ensures that the corps structure links to its subordinate division's SAAFR structure.

(7) Base defense zone. A BDZ is an AD zone established around an air base. It is limited to the engagement envelope of the SHORAD weapon systems defending that base. Theater army aviation elements operating in the COMMZ may encounter these control measures during airlift operations. BDZs have specified entry, exit, and IFF procedures that aircrews must follow.

(8) Weapons-free zone. A WFZ is an AD zone established to protect key assets or facilities of the joint force other than air bases. Air defense systems within a WFZ are normally maintained at a weapons control status of "weapons free." Aircrews must avoid active WFZs or coordinate their use with the designated control authority before entering or transiting the zone. Figure H-2 shows an example of a BDZ and a WFZ.

(9) Air corridor. An air corridor is a restricted air route of travel specified for friendly aircraft use. It is established to prevent the use of friendly forces against friendly aircraft. Air corridors are employed within the terrain flight environment, normally in the division area of operations. They are temporary corridors established to route combat elements of the division and corps aviation brigade between such areas as AAs, holding areas, BPs, FARPs, and target engagement areas. Several factors involved in air corridors are discussed below.

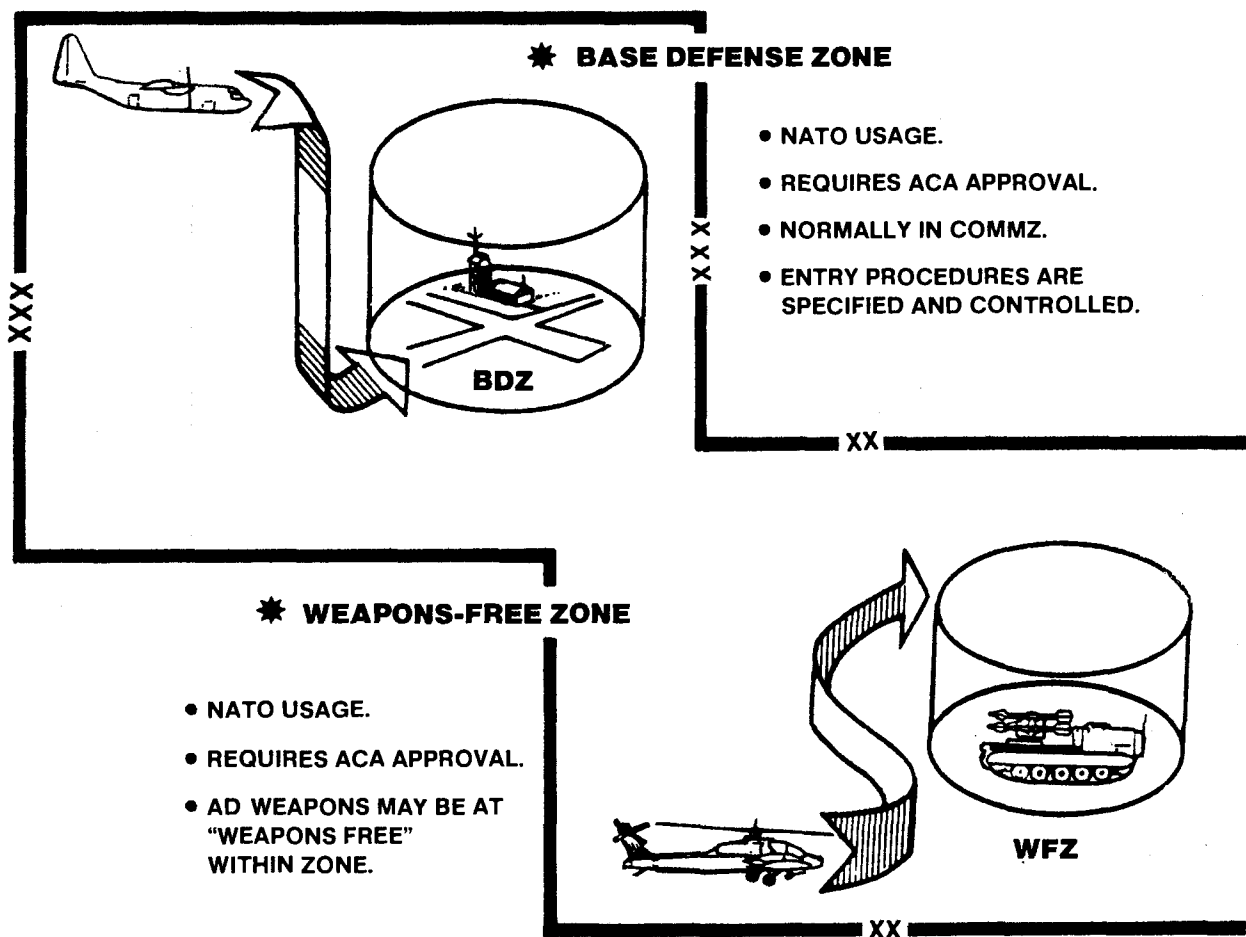


Figure H-2. Base defense and weapons-free zones

(a) Air corridors are employed as control measures during air assault operations to designate routes for air assault forces during the air movement phase. They can be used to route aircraft conducting air movement operations within the corps and division rear areas.

(b) The appropriate A²C² element advises and coordinates with the airspace control center on the placement and use of air corridors.

(c) An air route is an airspace procedural control measure normally employed in the COMMZ and corps rear area to control the movement of USAF and host nation air traffic.

b. Other Control Measures. Other control measures are used routinely to provide airspace users with greater freedom of operation and means of identification in the CZ. These means include traverse levels, time slots, and airspeed control.

(1) Traverse level. The traverse level is that height or altitude above a low-level AD system, expressed as both height above ground level and above mean sea level, at which an aircraft can traverse the area. This level is expressed as a vertical displacement above an LLAD area. It is used when the aircrew is unable to obtain clearance from the AD system or to comply with other prearranged recovery or transit procedures. The traverse level improves the effectiveness of AD systems by assisting aircraft identification while offering safe aircraft passage.

(2) Time slot. A time slot is a period of time during which certain airspace activities are restrained to permit other airspace users greater freedom of action. The establishment of a time slot includes procedures for canceling or modifying the time slot in case of communications failure or degradation.

(3) Airspeed control. Airspeed control is an additional airspace control procedure used by aircraft to assist AD systems in identifying them. It may be used along with height, direction, area, and time to supplement other forms of identification and airspace control.

APPENDIX I

SELF-DEPLOYMENT

This appendix implements portions of STANAG 3650 (Edition Two).

Aviation brigades must prepare to self-deploy aircraft, personnel, and equipment from CONUS stations to almost anyplace in the world. Self-deployment releases other transport assets for critical missions. The primary deployment requirement is from CONUS to the overseas theater. Secondary deployment requirements include forward deployment to the site of combat operations and deployment from forward deployment sites to another theater. Helicopter self-deployment is one of the US Army's most important and unique planning challenges. Units that plan, train, and validate their movement plans will greatly increase their chances of a successful deployment. This appendix serves as a planning guide for aviation units that may be required to self-deploy.

I-1. DEPLOYMENT MODES

a. Both ALOC and SLOC are used for helicopter deployment. However, these modes may not have enough assets or time to meet priority needs. AH-64, UH-60, CH-47C, and CH-47D helicopters can carry enough usable fuel to reach a deployable range. Table I-1 shows the characteristics of these aircraft; Figures I-1 through I-3 show proposed extended-range fuel systems for these helicopters. Other helicopters have no extended-range fuel systems; their primary deployment mode is by way of SLOC.

b. During the build-up phase of a conflict, the ALOC will be overloaded with high-priority shipments of troops, weapons, and materiel. The SLOC, though not required to transport high-priority cargo, will be heavily tasked to transport outsize and overweight cargo. The longer reaction time required for surface shipping may prevent helicopters from meeting rapid deployment dates.

Table I-1. AH-64, UH-60, CH-47C, and CH-47D characteristics

ELEMENT	AH-64	UH-60A	CH-47C	CH-47D
EMPTY WEIGHT (POUNDS)	10,980	10,495	21,678	22,623
SELF-DEPLOYMENT EQUIPMENT WEIGHT FOR MAXIMUM RANGE (POUNDS)	1,273	2,720	2,350	2,427
NORMAL INTERNAL FUEL WEIGHT (POUNDS)	2,442	2,350	6,765	6,765
RANGE ON NORMAL FUEL (NAUTICAL MILES)	360	370	350	350
MAXIMUM AUXILIARY FUEL (POUNDS)	6,370	8,840	19,500	19,500
MAXIMUM FERRY RANGE (NAUTICAL MILES)	1,089	1,114	1,219	1,179
GROSS WEIGHT FOR MAXIMUM RANGE (POUNDS)	21,065	24,405	50,293	54,000
AVERAGE TRUE AIRSPEED (KNOTS)	124	118	125	130
MISSION TIME (HOURS)	8.5	10.3	10.6	9.8

I-2. DEPLOYMENT FUNDAMENTALS

a. When aviation brigade units in CONUS receive the directive to execute deployment operations, they ferry their aircraft using preselected routes to CONUS departure points. The preselected routes are included in the units' deployment OPLANS. The departure points are operated by units that can perform depot-level maintenance. Deploying units arrive at the departure points according to the established sequence for force deployment or as otherwise directed. As the units arrive, a dedicated depot support team prepares the aircraft for deployment. Preparation includes required aircraft maintenance and installation of ferry equipment. Concurrently, the deployed element is integrated with its aerial support team. Then the deploying unit is prepared to depart CONUS.

b. The deployment execution directive dispatches predesignated ground support teams to stopover points along self-deployment flight routes. The ground support teams include personnel, equipment, and repair parts to provide limited services. These services include maintenance, POL, supply, medical, communications, weather forecasting, flight planning, and house-keeping. To save time, units pre-position some of the required equipment and repair parts at stopover points.

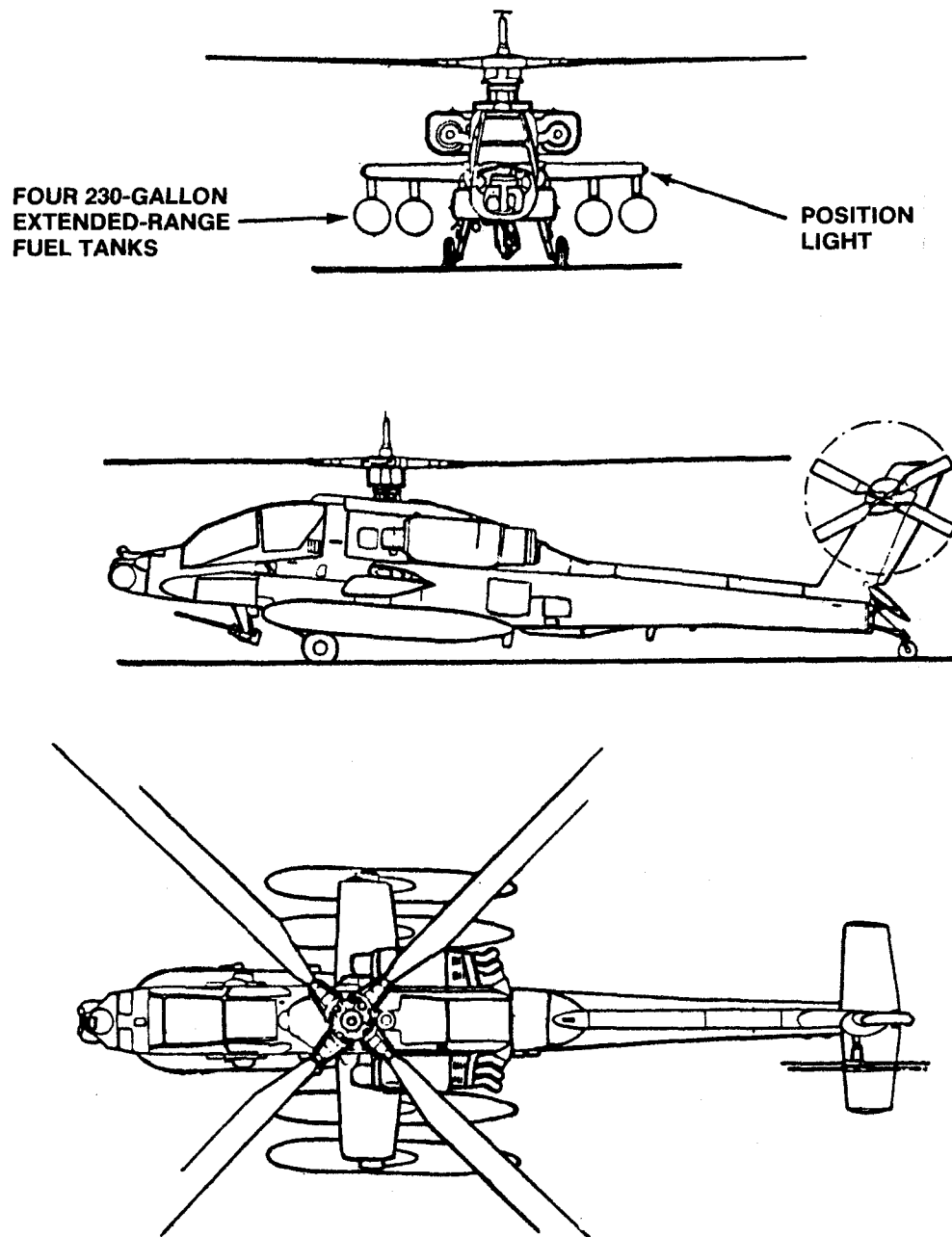


Figure I-1. AH-64 extended-range fuel system (proposed)

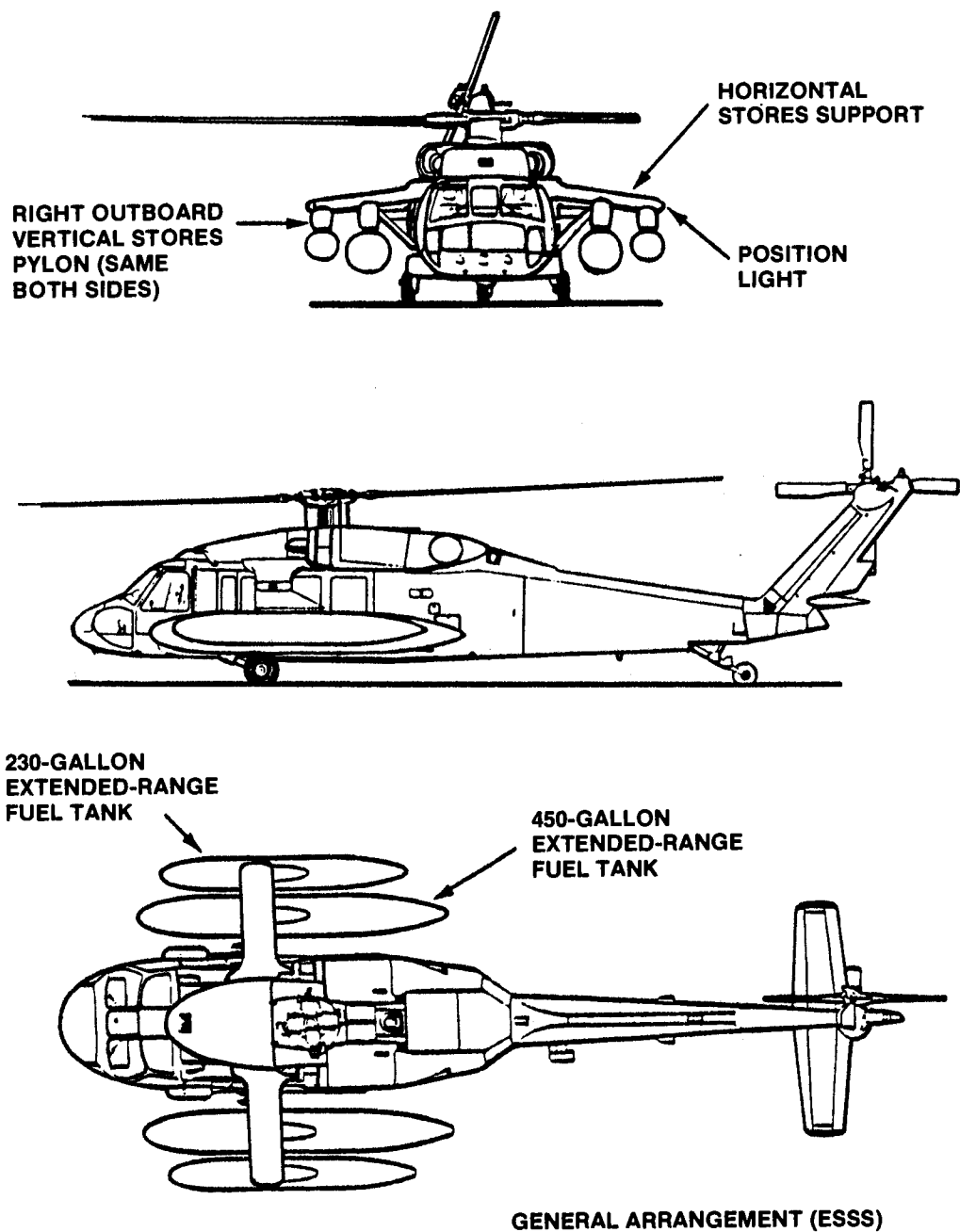


Figure I-2. UH-60 extended-range fuel system (proposed)

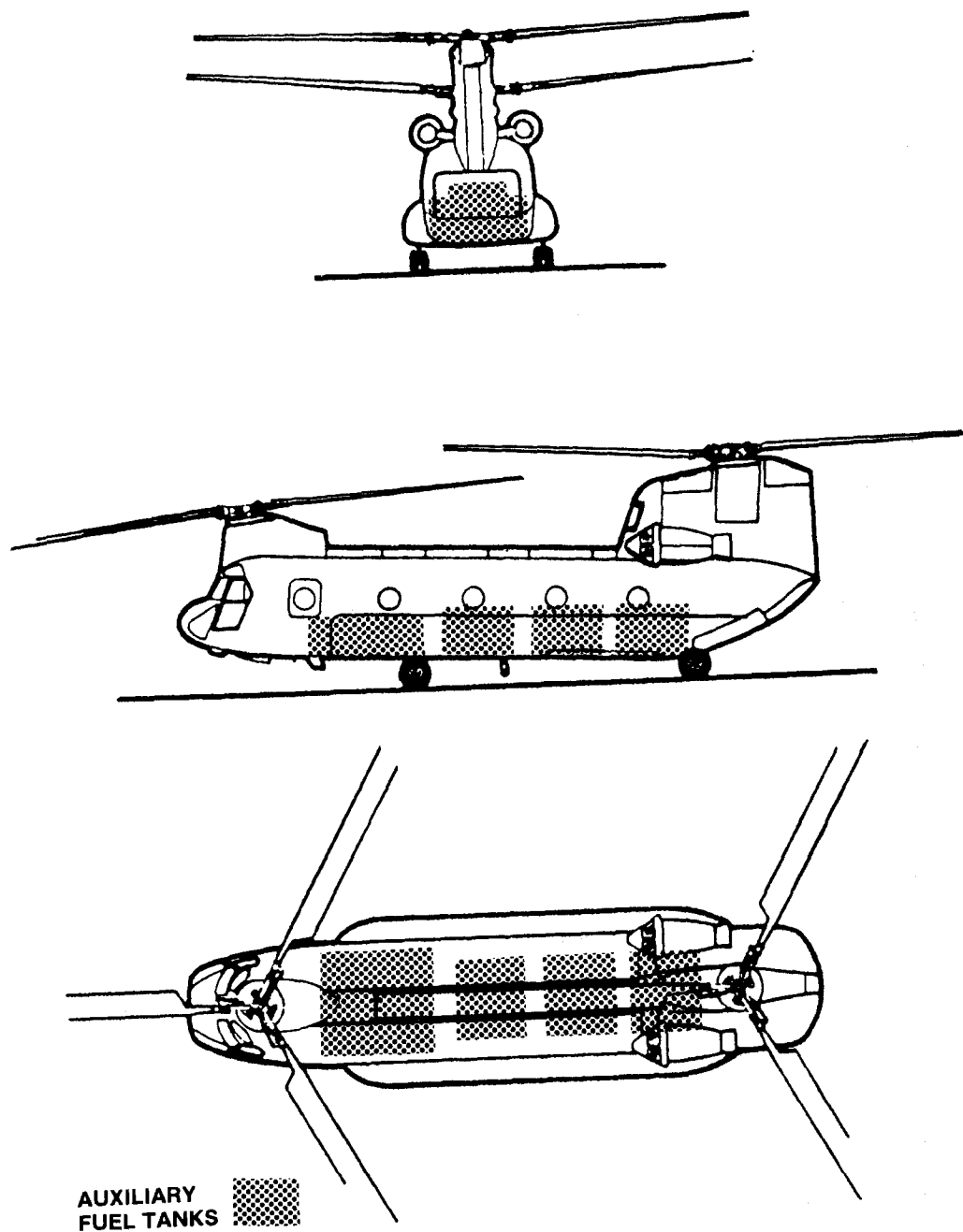


Figure I-3. CH-47 extended-range fuel system (proposed)

c. Predesignated aerial support teams provide en route assistance and expertise to the self-deploying aircrews. These teams consist of two ferry- and rescue-qualified aviators who are familiar with the proposed route. The team members fly as pilots in command in both the lead and trail aircraft of the deploying flight. Aerial support teams may be organic to a depot and composed of Active Army and Reserve Component aviators.

d. Deployment flights terminate at depot or AVIM facilities in the theater. Personnel at these facilities remove ferry equipment, install combat mission equipment, and perform required maintenance and inspections to prepare the aircraft for combat. They also coordinate the immediate backhaul of predesignated aerial support teams and ferry equipment. Normally, aerial support teams and ferry equipment are shipped by high-priority airlift to CONUS for reuse in later flights. Like aerial support teams, AVIM facility personnel are preselected and dispatched when the deployment directive is issued. Most of the required equipment is prepositioned in the same manner as the en route ground support equipment. To facilitate the integration of deploying aircraft and crews into a theater combat force structure, command facilities must be located at each termination site.

e. When aviation brigade units are deployed to destinations beyond those with fixed-base facilities, predesignated ground support teams are positioned to perform those functions described in b above. If ground support teams are not available or cannot be emplaced, provisions may be made for friendly nations to provide the required services.

I-3. RESPONSIBILITIES

a. Commander. The commander is responsible for the movement of his unit's personnel and equipment. Therefore, he reviews and validates SOPs and movement and load plans. The commander supervises the operation of subordinate units and coordinates with other headquarters for technical data and logistics support. He establishes policies for air lines and sea lanes of communication and ensures that personnel comply with directives, policies, and regulations. The commander also directs the safety and accident prevention program so that self-deployment operations are conducted safely. (Appendix C describes risk management.)

b. Personnel (S1/G1). The S1/G1 is responsible for unit-strength maintenance and personnel service support. He ensures that personnel in deploying units and support teams are qualified to perform the mission. The S1/G1 manages the safety and accident prevention program planned and implemented by the aviation safety officer. He implements a plan to care for nondeployable personnel and family members of deploying personnel.

c. Intelligence (S2/G2). The S2/G2 is responsible for self-deployment intelligence operations. He prepares the intelligence estimate for the self-deployment operation. Staff officers use the intelligence estimate to determine how the Threat will affect their areas of responsibility. The S2/G2 is responsible for the IPB. The IPB provides detailed information about the Threat, weather, and deployment routes. The S2/G2 provides deploying aircrews with USAF long-range weather forecasting information as

well as counterintelligence estimates. He also plans and supervises the implementation of counterintelligence measures to support the operation. These measures include the counterintelligence aspects of deception to support C³ countermeasures.

d. Operations and Plans (S3/G3). The S3/G3 prepares the OPLAN and contingency plans. These plans are implemented when the order is received to self-deploy aircraft or to support a deploying unit. The S3/G3 task-organizes and trains the unit to meet the requirements of the OPLAN and contingency plans. The S3/G3 of a self-deploying unit plans and conducts the deployment of the remainder of his unit with available resources. He then plans the assembly of these two separate segments of his unit and prepares them for entry into the theater as a combat-ready unit. The S3/G3 of the supporting unit coordinates the redeployment of aerial support teams and equipment identified for immediate return.

e. Logistics (S4/G4). The S4/G4 of both the self-deploying unit and the supporting unit are responsible for logistics requirements along the self-deployment route. They coordinate closely with each other and the aviation maintenance officers. The S4/G4 determines what is already pre-positioned at intermediate sites and what should be deployed to them. The supporting unit's S4/G4 coordinates the deployment of support teams and equipment to their respective sites. The self-deploying S4/G4 is involved in deploying the remainder of his unit. Aviation maintenance officers organize a maintenance support operation to prepare aircraft for self-deployment and to meet scheduled and unscheduled maintenance requirements along the route.

f. Civil-Military Affairs (G5). The G5 of the self-deploying unit assists the staffs of both self-deploying and supporting units. He requests and coordinates maintenance and crew rest facilities, fuel, and messing for stopover-point teams and self-deploying aircrews. The G5 is the point of contact for staff officers who deal with host nations.

g. Unit Movement Personnel. Unit movement personnel develop SOPs and movement and load plans. They train unit movement personnel and ensure that personnel and equipment are prepared for the move. Unit movement personnel inspect and inventory equipment before and after the unit moves. They also ensure that appropriate support and logistics requirements are requested.

I-4. COMMAND CONSIDERATIONS

a. The command structure must be able to integrate the self-deploying aircraft and crews into the theater. Thus aviation assets will be available and effective at the area of operations.

b. Planning is an important aspect of self-deployment. Important planning considerations include--

- Threat.
- Mission.

- Time.
- Fuel availability and location.
- Flight routes.
- Stopover points.
- Personnel and equipment requirements.
- Load and bump plans.
- Liaison.
- Movement C³.
- Operations security.
- Flight modes.
- Crew qualifications, requirements, and endurance.
- Diplomatic clearances, if required.

APPENDIX J

DEEP OPERATIONS

This appendix describes one of many possible scenarios for corps aviation brigade employment during deep operations. The scenario demonstrates many of the planning and execution tactics, techniques, and procedures from corps to ATKHB level.

J-1. CORPS AVIATION BRIGADE PLANNING PROCESS

The corps commander's operational concept is to integrate his corps plan with the 1st Army Group. He also wants to prepare for the counterattack by the 11th Corps (Figure J-1).

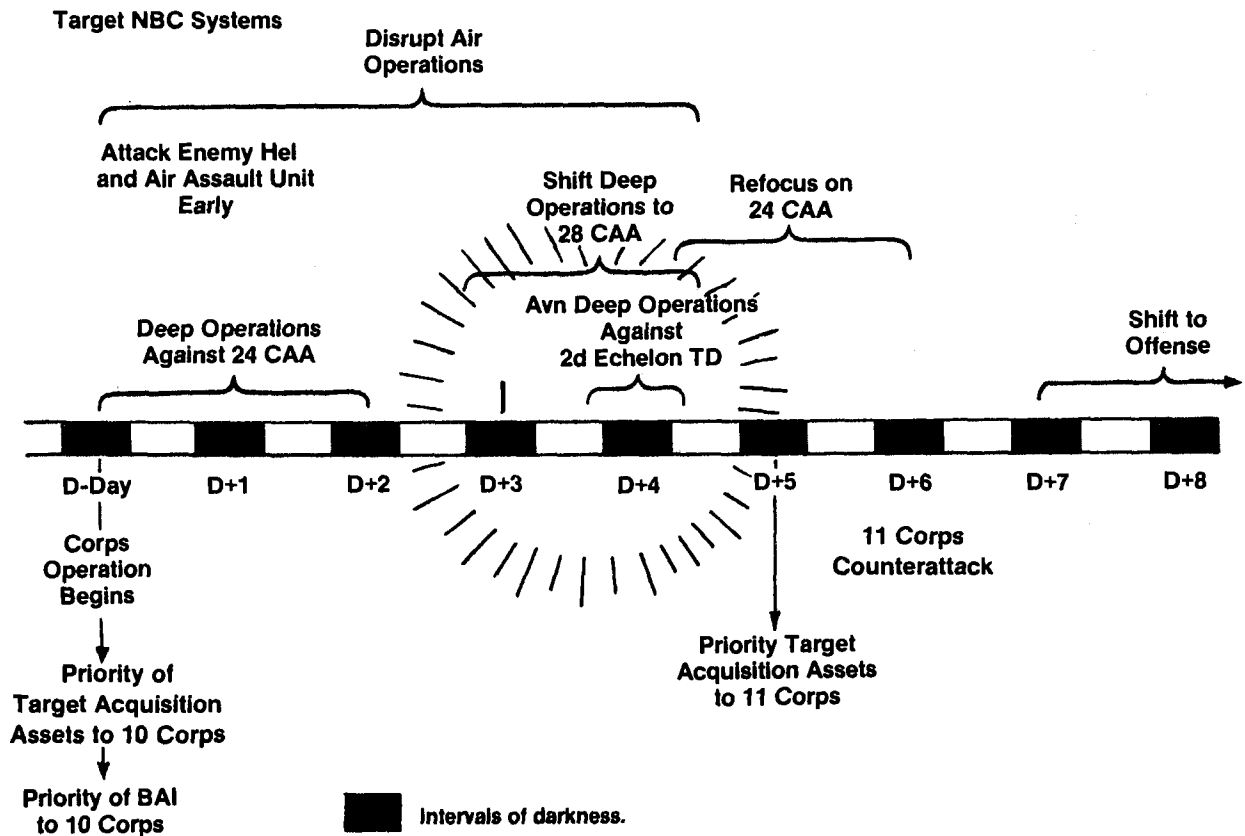


Figure J-1. Guidance from the corps commander

a. The aviation portion of the combined arms plan is extracted from the corps targeting guidance that is developed from the corps commander's intent. The corps commander will ensure that the deep operations focus at D+3/D+4 is on the 28 CAA. He wants to attack the second-echelon tank division of that army as it is being committed to the fight. Before attacking that tank

division, the corps commander will order a shift in the corps EW priority on D+3/D+4 to support the SEAD. This request is transmitted to EAC and modified or supported by the army group commander.

b. Attacking the enemy follow-on echelons is one of the missions of the ATKHBs in the attack helicopter group of the corps aviation brigade. The ATKHBs conducting a deep attack will normally operate at night; they require 24 to 48 hours of planning time. They also require accurate and timely intelligence before and during the mission. Aviation deep attack should be characterized by high-payoff targets that are critical to the corps commander's campaign plan.

c. The corps IPB to support the aviation portions of the mission will include terrain analysis to determine the effect of terrain on both enemy and friendly operations. Weather and illumination during the deep attack are also analyzed from both perspectives. Members of the planning staff must be familiar with the capabilities and limitations of enemy and friendly systems. Army aviation factors include NVD effectiveness, infrared crossover, and Hellfire missile environmental characteristics.

d. The enemy's disposition will be portrayed with templates to reflect the situation during the deep attack. This analysis will include the targets, the 22d Guards Tank Division, and enemy air defenses that can directly or indirectly alert and engage the friendly aviation force. It will also include uncommitted forces that could affect the situation during the deep attack.

e. Friendly forces must avoid mistaking an uncommitted enemy force for the target. Also, the brigade S2 wants to identify an uncommitted force that could influence the attack. NAIs are established to identify or confirm possible enemy actions. TAIs are established to expedite the delay, suppression, or destruction of the enemy unit. Decision points will be selected considering friendly response times and enemy movement rates.

f. The corps IPB is continuous. Intelligence collection and analysis efforts feed the process. This process integrates the analysis of terrain, weather, and the enemy to support the recommendation of--

- Ingress and egress routes.
- Release points.
- Rally points.
- Holding areas.
- Battle positions.
- Downed aircrew pickup points.

g. First the terrain and weather estimates of the engagement area are completed. Then potential aircraft routes are considered. Weather

conditions en route do not have to meet the requirements for the target engagement area because aircraft systems allow aviators to fly in visibility too low for Hellfire missile employment. Air routes should bypass enemy units, especially air defense. Terrain should afford terrain masking--for example, swampy, hilly terrain; mountains; and dense forests.

h. During the IPB, NAIs and TAIs will be designated. TAIs eventually become engagement areas for attack helicopter operations and areas in which targets are located for artillery fires and EW targets. Intelligence collection and analysis efforts support the IPB.

i. The corps IPB determines which specific second-echelon target is selected. The corps staff constructs an attack criteria matrix (Figure J-2) that lists and compares specific targets and considers time of attack. The effect on the target, the duration of the effect, and the attack system best suited to destroy or delay the enemy element are analyzed.

ENEMY ACTIVITY	TARGET/TARGET SET	ATTACK TIME	DESIRED EFFECT	DURATION OF EFFECT	ATTACK SYSTEM	COMMENTS
AIR OPS		D-DAY/D+2	DISRUPT DEEP STRIKES			PROTECT COSCOM, BRIDGES, 11 CORPS
			PREVENT AIR ASSAULTS			BRIDGES OVER KANSAS RIVER
NBC		D-DAY/INDEF	DESTROY	PERMANENT		PROTECT BRIDGES
MANEUVER	AIR ASSAULT	AS ACQUIRED				FRONT & ARMY ELEMENTS
	2D ECH MRD/24 CAA	D-DAY/D+2	DEGRADE DEF CAPABILITY	INDEF		HAND OFF TO DIV, NO COUNTERMOBILITY
	2D ECH TD/28 CAA	D+3/D+4		INDEF	AVN BRIGADE	SEAD
	25 TA	D+4/D+5	DELAY MOVEMENT	INDEF		SYNCH W/11 CORPS
C ²	24 CAA	D-DAY/D+2	DISRUPT	24 HOURS		"AT RIGHT MOMENT"
	ADA	D+3/D+4				SEAD

Figure J-2. Attack criteria matrix

j. Through analysis, these targets become specific high-value target sets (Figure J-3) that are critical to the corps plan. In this scenario, that specific target is the second-echelon tank division, the 22d GTD of the 28 CAA. Based on target analysis and the corps commander's guidance, this plan calls for the 22d GTD to be attacked as it moves from its assembly area to the forming-up point. That forward movement is expected to take place at night. From the high-value target set analysis, the corps staff can recommend an appropriate system. The only systems that could hit the second-echelon tank division are BAI, ATACMS, and Army aviation. Because night-capable BAI systems are very limited and ATACMS Block I is mainly for soft targets, Army aviation may be the only choice for a night attack against a

deep, armored column. BAI missions are requested for first light as a backup to the attack helicopter deep attack in case AH-64 units cannot meet the night attack window or enemy units do not move as quickly as planned.

ENEMY ACTIVITY	TARGET/TARGET SET	QUANTITY	ATTACK TIME	DESIRED EFFECT	DURATION OF EFFECT	ATTACK SYSTEM	COMMENTS
AIR OPS	FACs	(6)	D-DAY ON	DESTROY	PERMANENT	AREA-TYPE	
	VTDPs	(8)	D-DAY ON	DESTROY	PERMANENT	AREA-TYPE	
	FWD OP BASES	(2-8)	D-DAY ON	DESTROY	PERMANENT		
NBC	SSM TELs	(26)	D-DAY ON	DESTROY	PERMANENT		
	SSM FOC	(7)					
	SSM NASP	(8)					
	SSM MET RADAR	(6)					
MANEUVER	20 ECH MRD/24 CAA	(4 X REGT +)	D-DAY TO D+2	DELAY	BEYOND D+3	BAI/ ATACMS	NO COUNTERMOBILITY
	20 ECH TD/28 CAA	(4 X REGT +)	D+3/D+4	DESTROY	PERMANENT	AVN BDE	SEAD, ECM, BAI
	25 TA	(4 X DIV +)	D+4/D+6	DELAY	24 HOURS	BAI	LIMIT EARLY, DISRUPT
C ²	CPs/24 CAA	(5)	EARLY D+3	DESTROY	PERMANENT	LANCE/ ATACMS	
	ADA	(4 X ADA REGT +)	D+3/D+4	DISRUPT	DURATION OF AVN BDE OPS	EW(+)	SEAD
ADA	SA 11 TEL RADARS	(100 +)	D+3/D+4	DESTROY	PRIOR TO H HOUR	MLRS/ LANCE/ ATACMS/ WW	SEAD INTEGRATE DIV
	SA 11 COMM NETS	(8)	D+3/D+4	DISRUPT	AT H HOUR	EAC ECM	- AIR AXIS +8 KM - ALL ACTIVE
	SA 12 TEL RADARS	(86)	D+3/D+4	DESTROY	PRIOR TO H HOUR	LANCE/ ATACMS/ WW	- AIR AXIS +8 KM
	SA 12 COMM NETS	(4)	D+3/D+4	DISRUPT	AT H HOUR	EAC ECM	- ALL ACTIVE

Figure J-3. High-value target sets

k. With the corps commander's issuing his guidance at H-96, the staff planning process begins (Figure J-4). The G2 staff begins to analyze terrain. Using maps and photos and with the help of the engineer topographic team, the staff analyzes projected ingress and egress routes as well as potential engagement areas. The staff examines the combined effects of weather and terrain as well as available moon, star, and manufactured illumination. The staff also considers the effect that the enemy disposition may have on friendly operations. It considers particularly the major target, the second-echelon TD, enemy AD locations, and major uncommitted units (regiment

and higher). NAIs are selected based on terrain where the enemy commander has to make decisions. The TAI, which becomes the engagement area for the aviation attack, is selected based on terrain. The charts show a break between situation development and target development; however, both are continuous. H hour is established for all systems participating in the deep attack. In this instance, it is 1900 on D+3. H hour in the deep attack scenario is the time when all systems are ready to perform their mission. This condition must take place before the enemy target arrives at the engagement area. The H-hour time must allow for the suppression of enemy systems that were identified during the IPB. The H-hour time must also be selected so that artillery, MI, and Army aviation units can prepare before the enemy arrives at the engagement area. The H-hour, or ready, time must allow time for the units to be alerted, move to their positions, and conduct the mission.

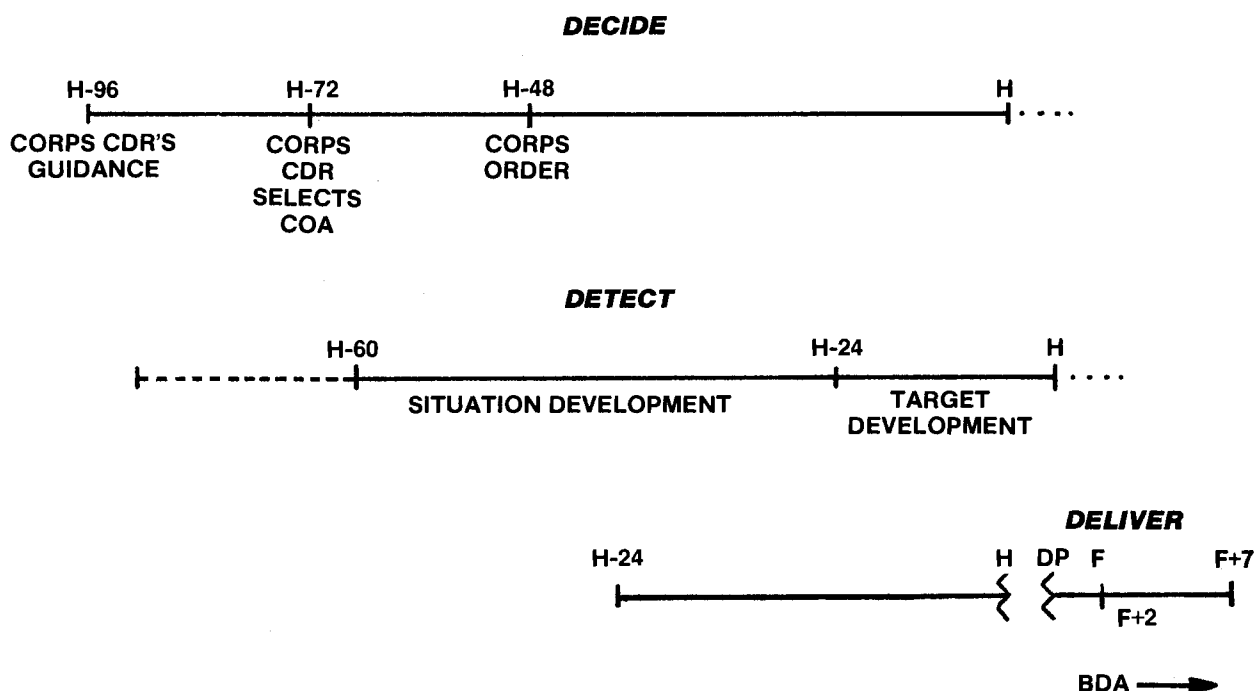


Figure J-4. Intelligence support

l. The corps planners begin an IPB at the front end of the mission analysis. They develop a sensor matrix that matches sensors to targets; these sensors must be able to collect against the targets. This matrix will assist later in preparing the collection plan.

m. All-source analysis has projected that the 22d GTD will move from its intermediate assembly area to its forming-up point on the night of D+3

(Figure J-5). From the IPB, corps planners select an engagement area along the two principal avenues of approach. The engagement area should canalize enemy forces and restrict their movement as well as provide terrain masking and good fields of fire for attack helicopters.

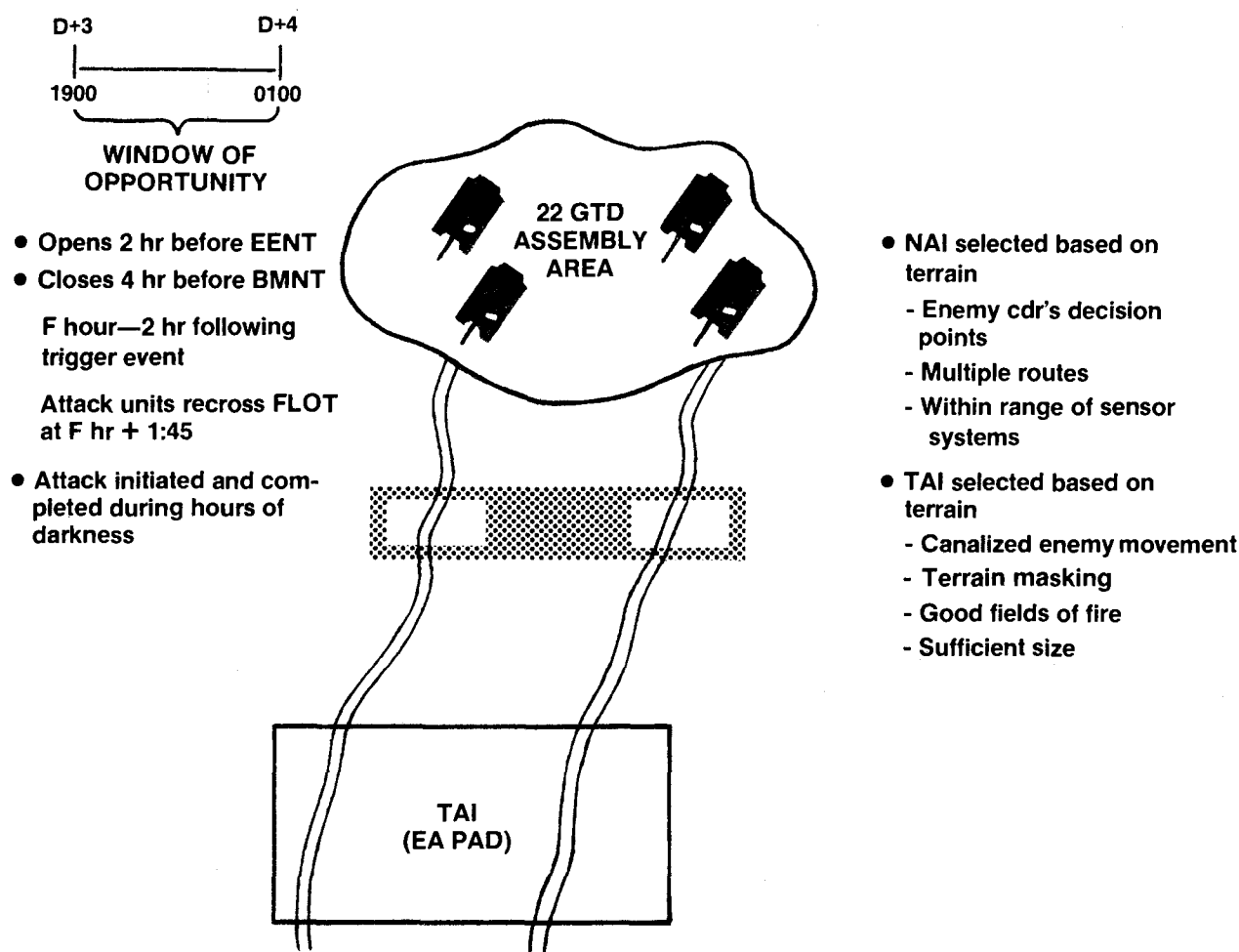


Figure J-5. Designation of NAI and TAI

n. The engagement area is designated as EA PAD. About 20 kilometers wide and 50 kilometers deep, it is about 60 kilometers from the intermediate assembly area. The enemy march columns should reach EA PAD from the intermediate AA in about three hours. From the friendly FLOT to the center of EA PAD is about 70 kilometers.

o. During planning, it was determined that the aviation units require a two-hour notice before the enemy enters EA PAD. Thus after units fly to EA PAD, they will still have time to finalize and execute the SEAD plan; they will also have time to complete other supporting plans and actions. NAIs

were chosen along the avenues of approach about a two-hour traveling distance from EA PAD. This calculation is based on a 20-kilometer-per-hour rate of march.

p. The plan is to use Mohawk SLAR (UPD-7) and LRSUs to monitor the enemy's movement out of the intermediate assembly area into the NAI and TAI. When the number of armored vehicles moving out of the AA reaches the threshold established by the corps, the LRSU teams report back to the CTOC. The movement also detected by the Mohawk SLAR will confirm the movement out of the AA.

q. Corps planners have recommended an attack on the 22d GTD. Sensing packages and attack means are identified. The corps commander then orders the aviation brigade to attack the 22d GTD.

r. The collection, management, and dissemination section directs the collection effort against the main target. Situation and target development efforts must also be focused on targets that may interfere with the aviation brigade mission; the attack helicopter operation will require SEAD. Therefore, at this stage, the intelligence staff is also tasked to collect information on enemy AD targets along planned routes of ingress and egress; the staff will also collect information in and beyond the planned engagement areas. Targets are located on enemy AD installations during this collection effort; these locations are provided to the FSE to update the fire support plan that supports the attack. This fire support plan includes not only lethal attack on AD targets but also nonlethal (EW) attack. The G3 requests EW support from higher headquarters to engage AD targets in depth. He coordinates with the corps G2 in tasking division EW assets needed to support FLOT penetration by jamming AD command and control nets near the FLOT. EW support is executed during planned lethal attacks. The mechanisms for accomplishing this tasking are the fire support plan and the EW annex, both of which are continuously updated.

s. A collection plan based on available resources is developed to support the situation. Early in the decision phase, the corps G2 (the CM&D section) will devise a plan. This plan will provide adequate coverage, synchronize sensors (cueing, cross-cueing, and jamming), request national and theater assets, and begin to provide intelligence support to SEAD. The aviation brigade warning order is issued at H-72. The aviation brigade tactical CP relocates near the corps main CP shortly after the warning order is issued. This movement occurs in darkness. Figure J-6 identifies key actions in this segment.

- Prepare collection plan based on COA/HPT list
- Prioritize collection of—
 - Enemy AD targets (national ELINT, QL II)
 - Enemy activity (national/theater imagery, OV-1D SLAR, IGRV, LRSU)
 - Targeted tank division
 - Uncommitted units
- Plan collection effort against enemy AD in conjunction with current friendly air operations

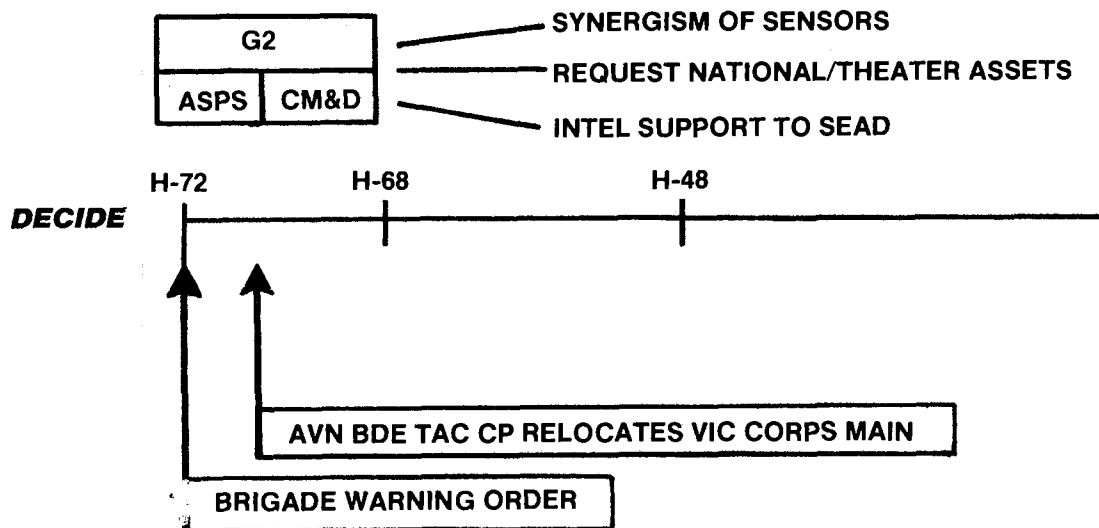


Figure J-6. Event sequence

t. The target list is based on the course of action selected by the corps commander (Figure J-7). The targeting element will develop target sets, time lines, priorities, and planning considerations. The aviation brigade target list will include targets such as--

- Tank and MR AD systems (ZSU-23-4/2S6 and SA-9/SA-13).
- Divisional AD batteries (SA-6/SA-8).
- Army-level systems (SA-11/SA-12).
- The second-echelon tank division.

The aviation brigade commander will restate the mission to the corps commander 8 to 12 hours after receiving the mission. The aviation brigade commander and the G2 will also submit requirements for intelligence support.

EVENT SEQUENCE

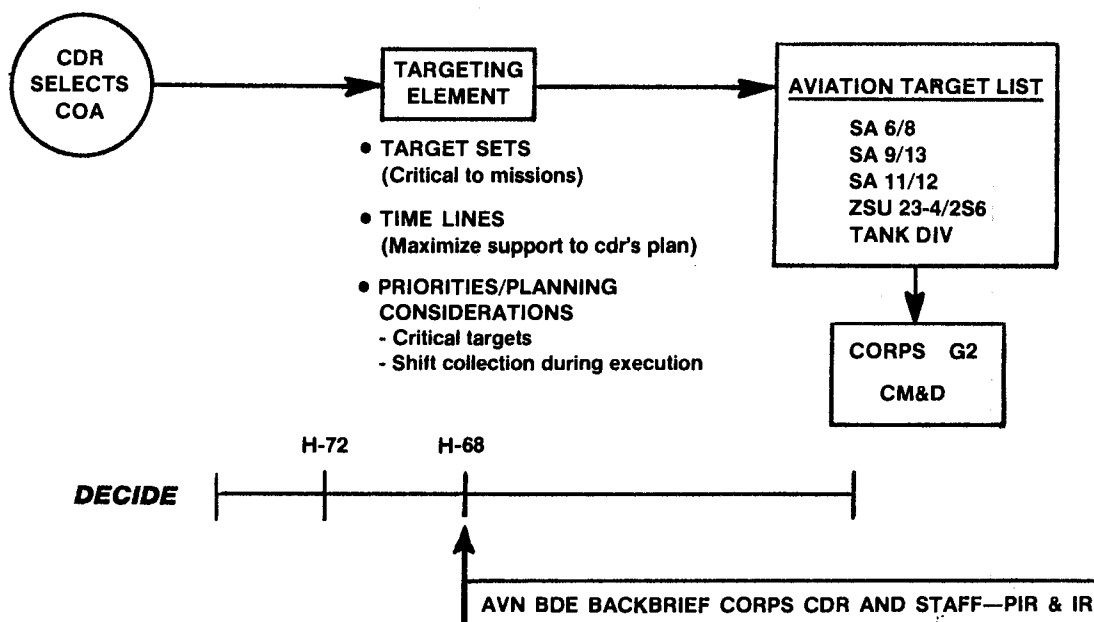


Figure J-7. Development of the target list

u. About H-60, specific orders and requests are sent to corps subordinate divisions, the MI brigade, adjacent corps, and EAC. The corps G2 (ASPS and the CM&D section) develops the requests and passes them to the MI brigade (Figure J-8). The technical control and analysis element will take the prioritized collection targets and turn them into collection taskings for the sensor platforms. The TCAE will search its enemy electronic order of battle data base for the location of radar emitters for enemy AD units that can track the attack helicopters along the ingress route, engagement area, and egress route. The TCAE also searches its technical data base for frequencies and call signs for the C² elements of specific AD units--the 22d GTD and the Army CP. This data is passed to the Guardrail IPF for the Guardrail mission. The S3 section of the MI brigade plots Guardrail flight tracks that will optimize the collection of COMINT targets. The section will also plot Quick Look II flight tracks for ELINT targets and Mohawk flight tracks for SLAR collection. These airspace requirements are then passed to the A²C² element of the corps for inclusion in the corps A²C² plan. This process is refined and updated within 22 to 24 hours.

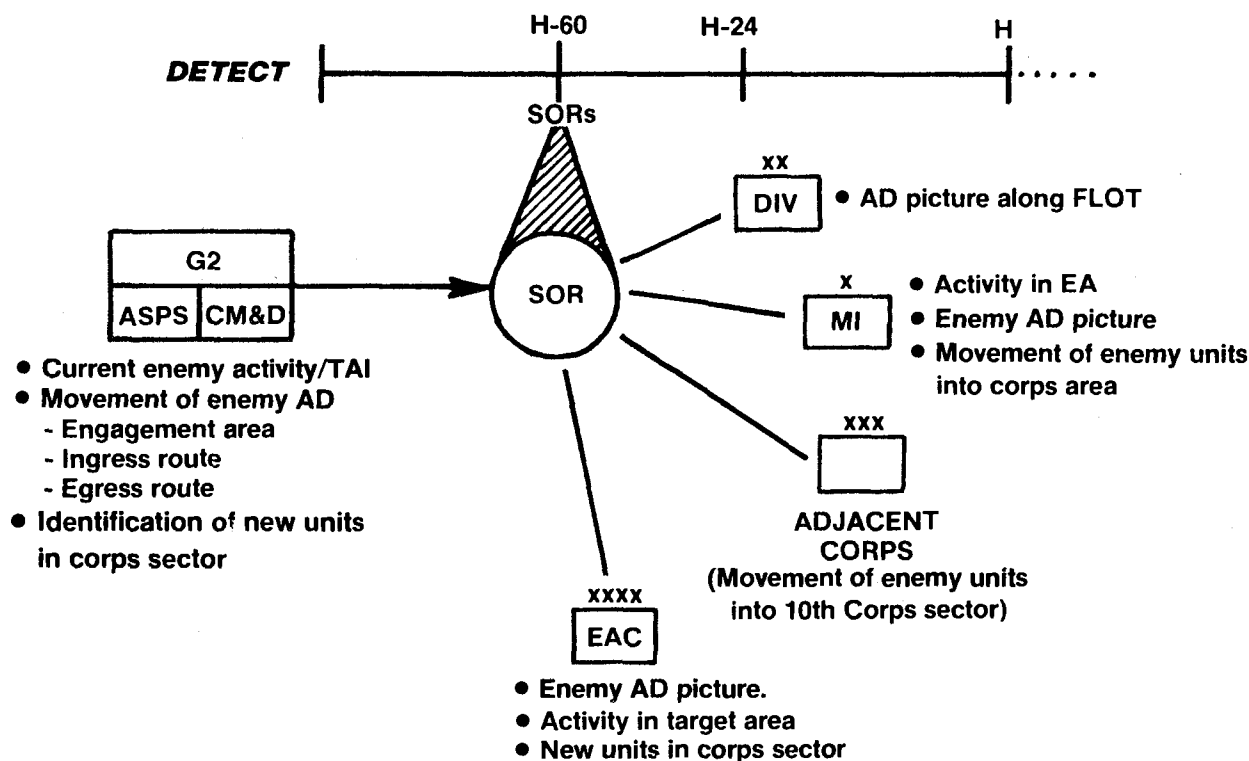


Figure J-8. Implementation of new taskings (SORs)

v. From H-60 to about H-24, sensors are identified to cover the corps area of interest on a more or less equal coverage basis. Quick Look II begins to locate the SAM radar sites, IGRV begins to intercept communications of the 28 CAA, and Mohawk SLAR monitors the enemy's movement forward. These sources provide an idea of the flow of the battle and possible enemy objectives or intentions. LRSU is inserted; it positions itself to support the operation as planned. Theater and national assets are requested to provide support as needed and to cover areas beyond the range of corps organic sensor capabilities.

w. During the processing and analysis, special attention is given to targets listed on the HVT list. The collection results reflect friendly capability to detect, identify, and locate targets. The HVT list is developed and refined based on the collection.

x. The target list provides the target descriptions, attack times, and attack methods; indicates battle damage assessment; and contains remarks concerning integration. The target list is shown in Figure J-9.

DESCRIPTION	WHEN	HOW	BDA	REMARKS
SA 6/8 (Straight Flush/ Land Roll)	F-0:15	FS/EW		Coord attack with avn bde
SA 9/13	F-0:15	FS/EW		Coord attack with avn bde
SA 11/12 (Fire Dome/ Grill Pan)	Immediately	FS/EW/USAF		
ZSU 23-4/2S6 (Gun Dish/ Hot Shot)	F-0:15	FS/EW		Coord attack with avn bde
Tank div	F+0:45 to F+1:00	Aviation	X	In/along TAI

FS = MLRS/ATACMS BLK 1
EW = Army/USAF jammers
AVN = Army aviation

Figure J-9. Target list

y. The aviation brigade target list is forwarded to the corps G2. During this portion of the decision phase, the aviation brigade commander restates the mission to the corps commander and his staff. The priority intelligence requirements and intelligence requests are established during this time.

z. Figure J-10 depicts the corps aviation brigade organization. This organization is structured to conduct close, deep, and rear operations. The group equipped with AH-64s normally conducts deep operations at night; however, the group equipped with AH-1s fights close operations in the daytime. The aviation group task force conducts CS and CSS operations.

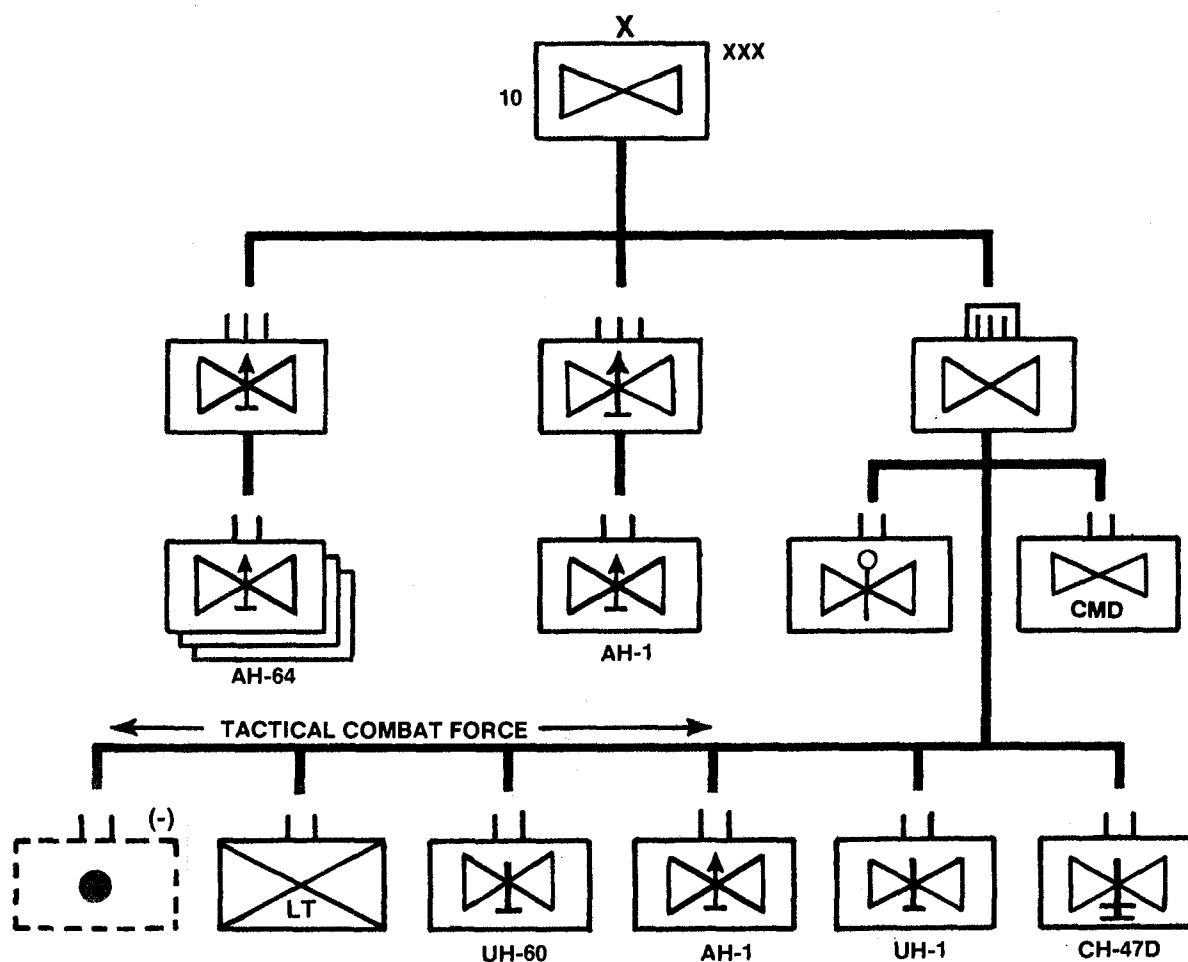


Figure J-10. Aviation brigade organization

J-2. MISSION

The 10th Aviation Brigade attacks and destroys the 22d GTD in EA PAD during the night of D+3/D+4 (Figure J-11). The aviation brigade commander uses his 103d Attack Helicopter Group (AH-64) for the mission. The group is to attack and destroy the three main tank regiments of the 22d GTD in EA PAD on D+3/D+4; on order, it has to support close operations. Thus each ATKHB attacks one enemy tank regiment. The 1-103 ATKHB--

- Occupies the forward assembly area.
- Attacks along Axis Alpha.
- Penetrates the FLOT at F hour.
- Occupies battalion attack positions.

- Destroys a tank regiment in its sector of EA PAD on D+3/D+4.
- Returns on Route Handy and conducts rearward passage of lines.

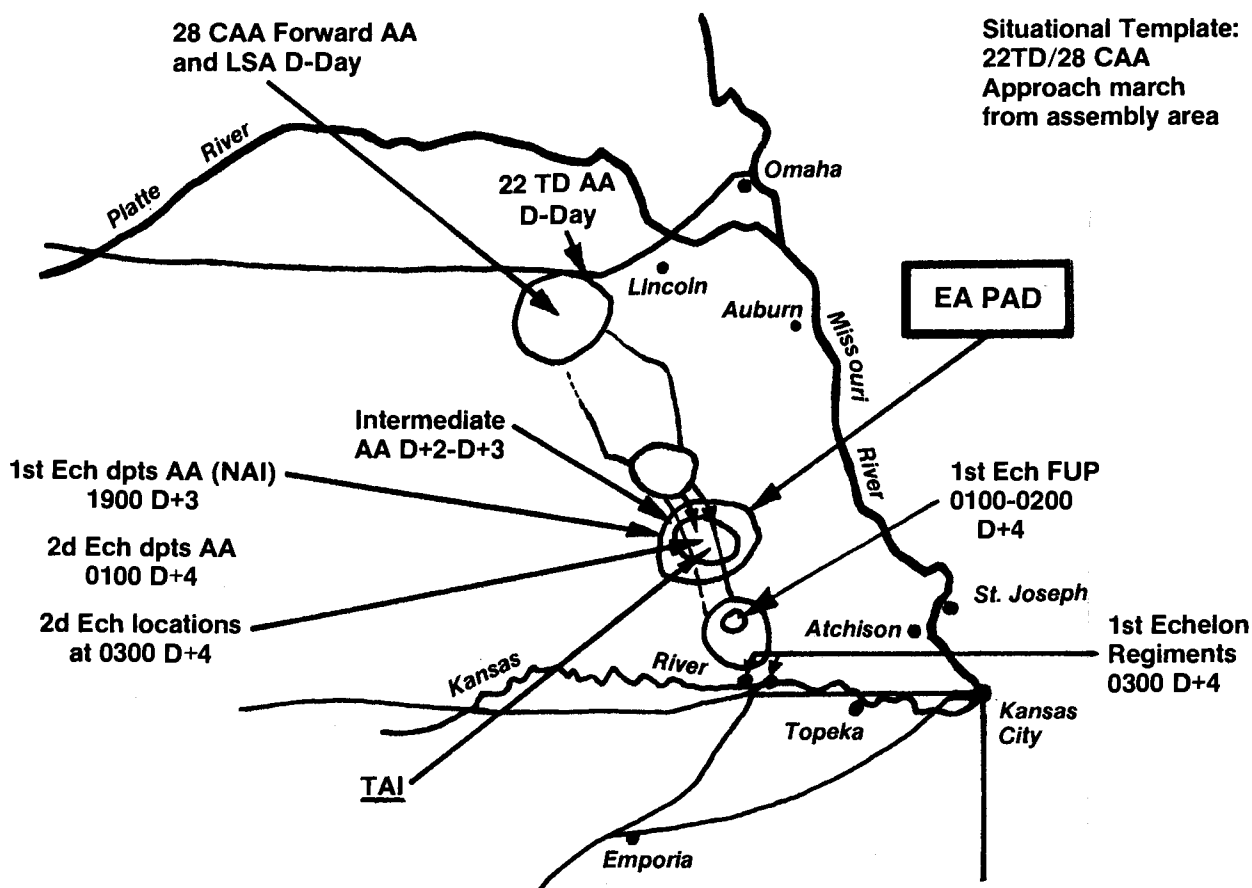


Figure J-11. EA PAD sketch map (situational template)

J-3. CROSS-FLOT ATTACK PHASES

The aviation brigade cross-FLOT attack is conducted in six phases: preparation, penetration, movement to the objective, actions at the objective, return, and restoration. Each phase requires extensive staff planning and coordination from corps level down.

a. Preparation.

(1) Mission analysis. The aviation brigade attacks and destroys the remaining elements of the 22d GTD as it is committed into the battle from its forward assembly area on the night of D+3/D+4. This target is suited for

attack helicopters (AH-64) because tanks and other vehicles will be moving on roads in the dark not expecting an attack. The individual tank regiments are out of range for MLRS; they are not suitable for ATACMS Block I.

(a) On D+3/D+4 the attack helicopter group attacks to destroy the 22d GTD of the 28 CAA in EA PAD. The aviation brigade commander estimates a destruction criteria of 70 percent of major weapon systems. The combat power of the 22d GTD has been reduced from four regiments down to the combat equivalent of three regiments after previous BAI attacks.

(b) The implied and specified tasks for each of the attack battalions of the attack group are to move (D+2/D+3) from the corps rear area forward to occupy assembly areas within range of the engagement area. From these forward positions, the battalions penetrate the FLOT at F hour, attack along an axis to an engagement area, and destroy an enemy tank regiment in EA PAD.

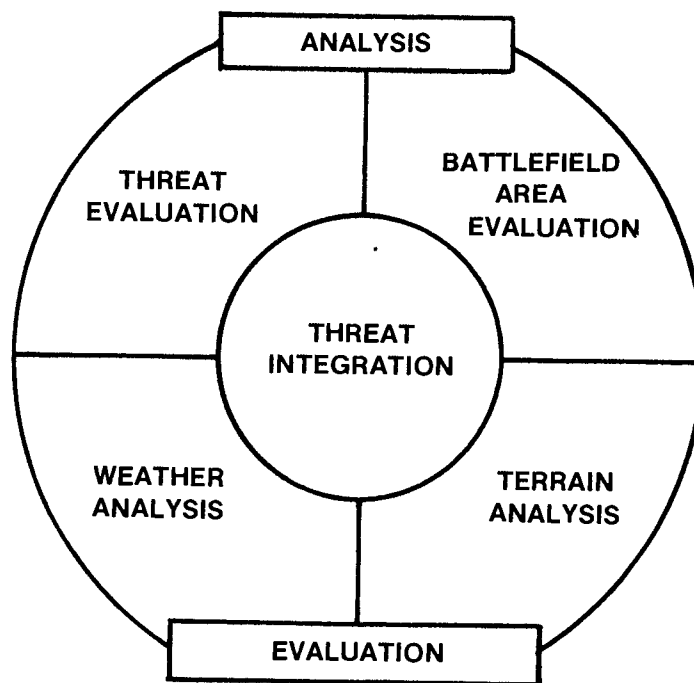
(c) The battalions return to the FAA while on an alternate route, conducting a rearward passage of lines; after their return, they are debriefed and they rearm and refuel. Aircraft are carefully checked for battle damage. They receive hasty repair before moving to the rear assembly areas.

(d) The 22d GTD's intermediate assembly area at D+2/D+3 is designated as an NAI. The NAI is monitored by Mohawk SLAR and LRSU as the 22d GTD moves toward the TAI; continuous reports are rendered through the GSM (LPU) back to the CTOC. The 22d GTD will use four or more routes; for simplicity, however, Figure J-11 shows only two routes.

(e) After the corps order is given to the aviation brigade, the intelligence process continues to support the brigade attack. The CM&D section must ensure that appropriate IMINT and SIGINT sensors are available throughout the attack to continuously update attacking aircraft and to provide BDA. Aviation elements are updated through intelligence reports from the CTOC to the aviation brigade tactical CP, located near the corps main CP, via area communications. During the operation, critical intelligence is passed from the CTOC to the aviation force via a Guardrail UHF relay. Another CTT is placed within the corps CTOC (CM&D) and a UHF voice-secure net is established to the aviation units. Over this net, units relay intelligence through one of the two operating Guardrail's AN/ARC-164 radios. This operation is not germane to the pilot or other operations of Guardrail. The ASPS continues the IPB; thus as enemy units continue their movement, attack battalions receive current intelligence. Movement of some enemy AD units could greatly affect ingress and egress routes.

(f) The aviation brigade uses the corps' IPB as a starting point (Figure J-12). The deep attack area of operations is the main focus for the aviation brigade S2. From the corps IPB, the aviation brigade S2 narrows the focus to address the axis of attack, ingress routes, the objective area, and egress routes. In selecting multiple routes and positions, the S2 considers primary and alternate routes, positions, and engagement areas.

IPB PROCESS



REFINE THE CORPS IPB

- Terrain analysis
 - Ingress routes
 - Engagement area
 - Egress routes
 - Weather/illumination
 - Enemy disposition
 - Major target (2d Echelon TD)
 - AD
 - Major uncommitted units
 - Designation of NAI
 - Designation of TAI
- } continuous planning

Figure J-12. Aviation brigade IPB

(2) Intelligence support H hour through return. At H hour, all sensors involved from H hour (2100 on D+3) through the return phase must be in place and functioning as planned (Figure J-13).

- Quick Look II focuses on the ingress and egress routes and the TAI to locate SAM radar sites. These locations are fed into the fire support system, suppressed during SEAD fires, and passed to the aviators for attack or avoidance. This suppression continues from F-15 throughout the cross-FLOT operation. Results from Quick Look II also feed the BDA.
- SLAR (OV-1D) monitors the movement of the 22d GTD out of the intermediate assembly area, along the avenues of approach, and into and out of the TAI. This information will be passed to users to update the situation and feed the BDA.
- IGRV intercepts communications within the 22d GTD and from the 22d GTD to army level. One of the two aircraft flying will be functioning as a radio relay to apprise aviation units of the situation and establish a C² link. Results from Guardrail will be used to assess enemy activity and intentions and will feed the BDA.

- LRSU will be in position to conduct surveillance at the NAIs and TAI to report passage of tank units of the 22d GTD by number and type.
- TR-1 (ASARS II) will be requested to surveil the TAI and attack axis for MTI before and during the operation.
- National ELINT will be requested to monitor AD targets in and beyond the TAI.
- National IMINT will be requested to cover the TAI at first light on D+4 to support BDA.

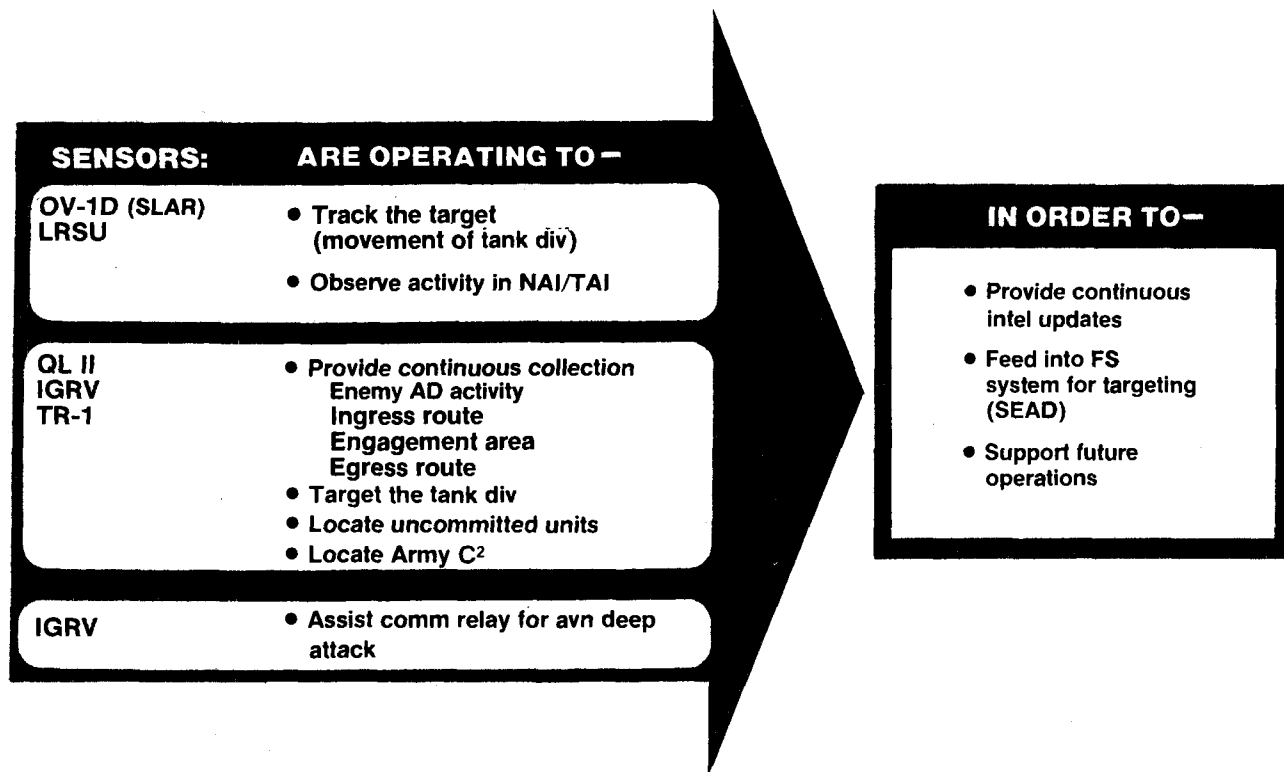


Figure J-13. Intelligence support--penetration through return

(3) Decision support template. The movement of the armored elements of the 22d GTD out of the assembly area through the NAIs is observed at the decision point. The key sensors are Mohawk SLAR and LRSU. This event triggers the aviation cross-FLOT deep attack. This sequence is depicted graphically in a decision support template (Figure J-14). Both Mohawk SLAR and LRSU at the NAIs and TAI (EA) continue to collect and report. These systems continuously update the movement of enemy formations and BDA.

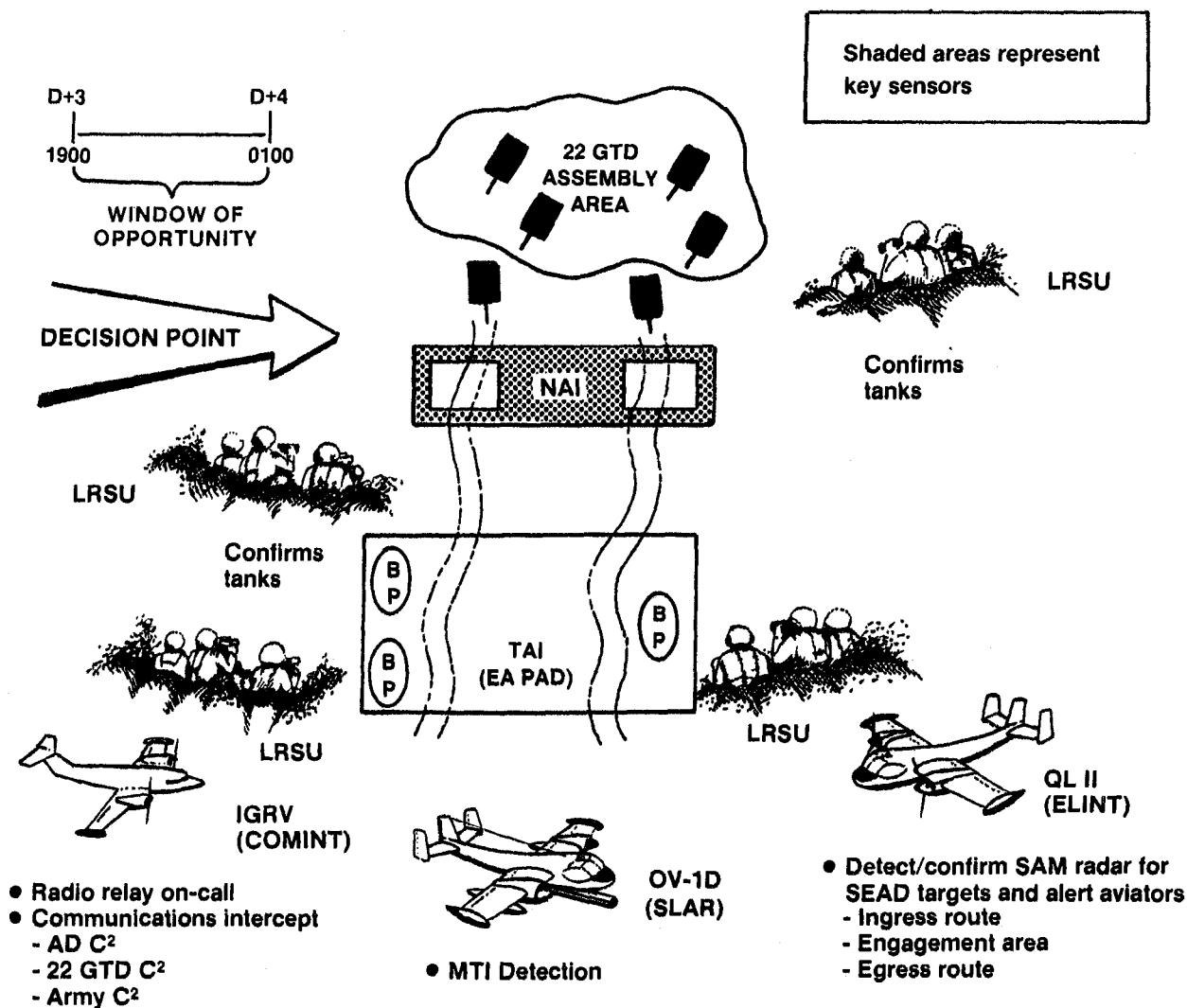


Figure J-14. Decision support template

(4) Task organization. Based on the mission analysis and situation, the attack helicopter group commander has task-organized his force (Figure J-15). The ATKHB comprises 18 AH-64s, 13 OH-58Cs, and 3 UH-60s. For deep operations against a maneuver force, the ATKHC may be task-organized into a scout team (OH-58C) and two attack teams (light and heavy). Also, an OH-58D from the target acquisition reconnaissance company may be attached to each ATKHC. The scout team coordinates passage points and assists the attack teams to and from the FLOT. The light attack team (2 AH-64s) may be equipped with 8 Hellfire missiles, a mix of 38 Hydra-70 spin-stabilized rockets, and 1,200 30-millimeter cannon rounds. The team designates targets for the heavy attack team and provides all-around security. The heavy attack team

(3 AH-64s) will equip their aircraft with a maximum load of 16 Hellfire and 1,200 30-millimeter cannon rounds (Figure J-16). The heavy team remotely engages targets designated by the light team.

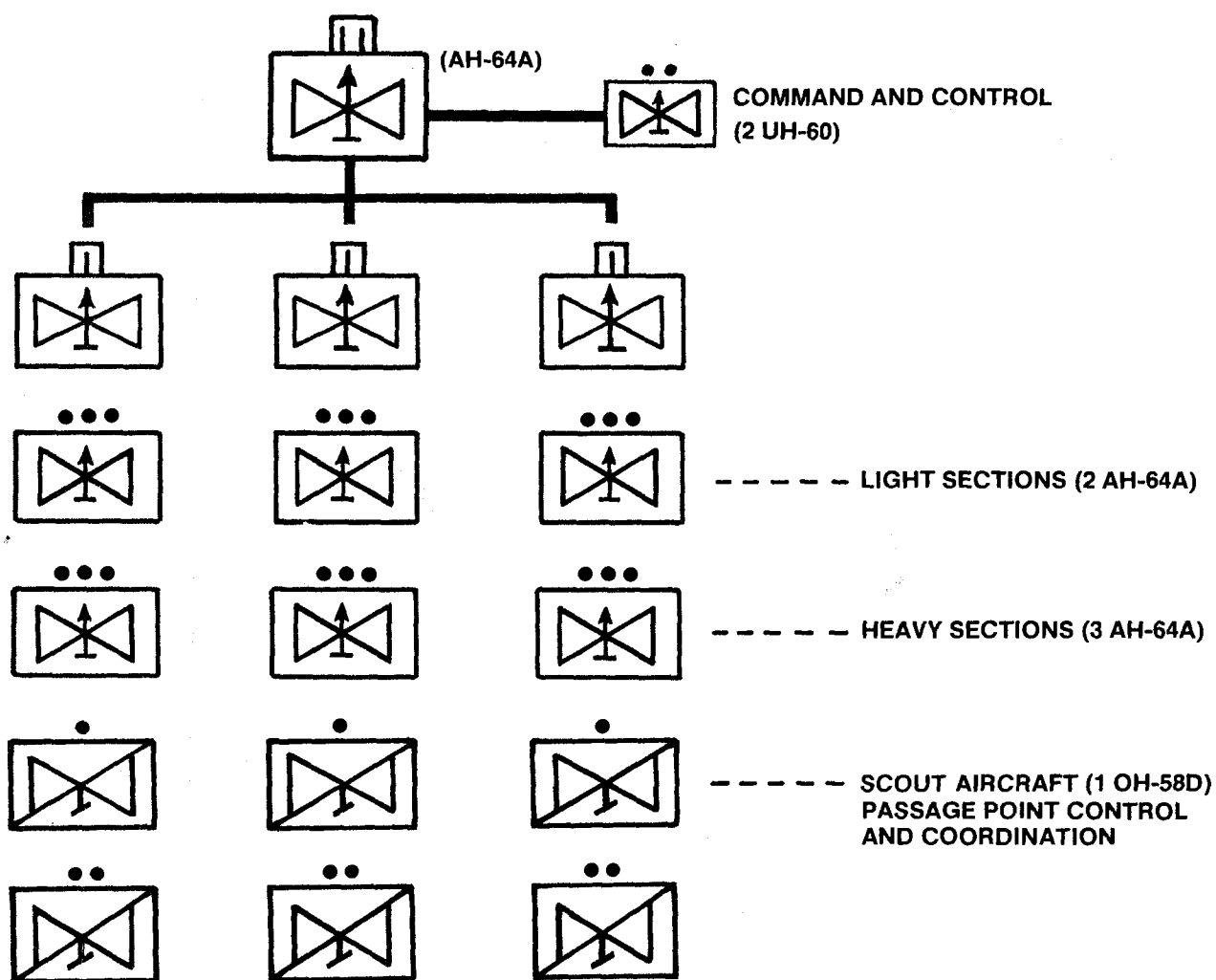


Figure J-15. Task organization of the ATKHB

UNIT	OPERATIONAL AIRCRAFT/ VEHICLE	ATGM	HYDRA 70
A Company	5 AH & 3 OH	64 Hellfire	76 Rkt
B Company	5 AH & 3 OH	64 Hellfire	76 Rkt
C Company	5 AH & 3 OH	64 Hellfire	76 Rkt
HHC	2 UH & 1 OH	0	0
Totals	15 AH, 10 OH, 2 UH	192 Hellfire	228 Rkt
D Company	HEMMT (CL III) HEMMT (CL V)		
TARP (-)	3 OH-58D		

Figure J-16. Friendly force inventory

(5) Gun-to-gun lay matrix. This matrix (Figure J-17) compares the relative combat power of an ATKHB and a tank regiment. The tank regiment has about 150 combat vehicles. With an operational readiness rate of 90 percent, the tank regiment would roll forward with 135 operational combat vehicles. The ATKHB will attack the tank regiment with 192 Hellfire missiles. A probability of hit of 60 percent has been determined from previous firing data, allowing a factor for defective missiles, combat losses, and combat environmental effects. The aviation brigade commander had established a 70 percent destruction goal. This simple process of estimation shows that a possible 115 combat vehicles would be destroyed.

TANK REGIMENT	150 CBT VEH	X (0.9) (OR RATE)	= 135 CBT VEH
ATKHB	192 HELLFIRE	X (0.6) (Ph)	= 115 CBT VEH
		REMAINING TANKS	= 20 CBT VEH
1 BTRY REGTL ADA	4 ZSU, 4 SA13		
1 BTRY MRD ADA	MAX 4 SA6 TEL 1 RADAR		
1 BAI MISSION	INDEPENDENT OPERATION		

Figure J-17. Gun-to-gun lay matrix relative combat power

(6) Command, control, and communication. Key staff officers at the corps main CP normally plan and execute deep operations. Locating the corps aviation brigade's tactical CP 3 to 5 kilometers away from the CTOC and communicating via landline expedite planning. Thus key personnel--the G3, assistant G2, FSO, ALO, and aviation brigade commander--can participate in planning and executing the operation.

(a) The aviation group positions a ground tactical CP; the tactical CP expedites C³ near the FAAs of the ATKHBs. During the mission, the attack helicopter group commander may command and control from an airborne tactical CP (UH-60).

(b) The battalion commander's location is key to his decision-making process; it also is crucial to his ability to control battalion actions as the operation unfolds. The forward assembly area is the last face-to-face coordination point between companies of the battalion. The battalion commander can command and control the mission from any location or vehicle he chooses; in the example, however, a UH-60 is used as an airborne tactical CP. There, he is with the fighting force and can make accurate and timely decisions. Any cross-FLOT operation will be battle-drill oriented. Radio listening silence can be maintained during the mission. However, necessary internal ATKHB communications can be conducted as depicted in Figure J-18. Figure J-19 depicts company internal communications. Artillery requests can be passed via FM from the light section to the FSO in the group airborne tactical CP (Figure J-20).

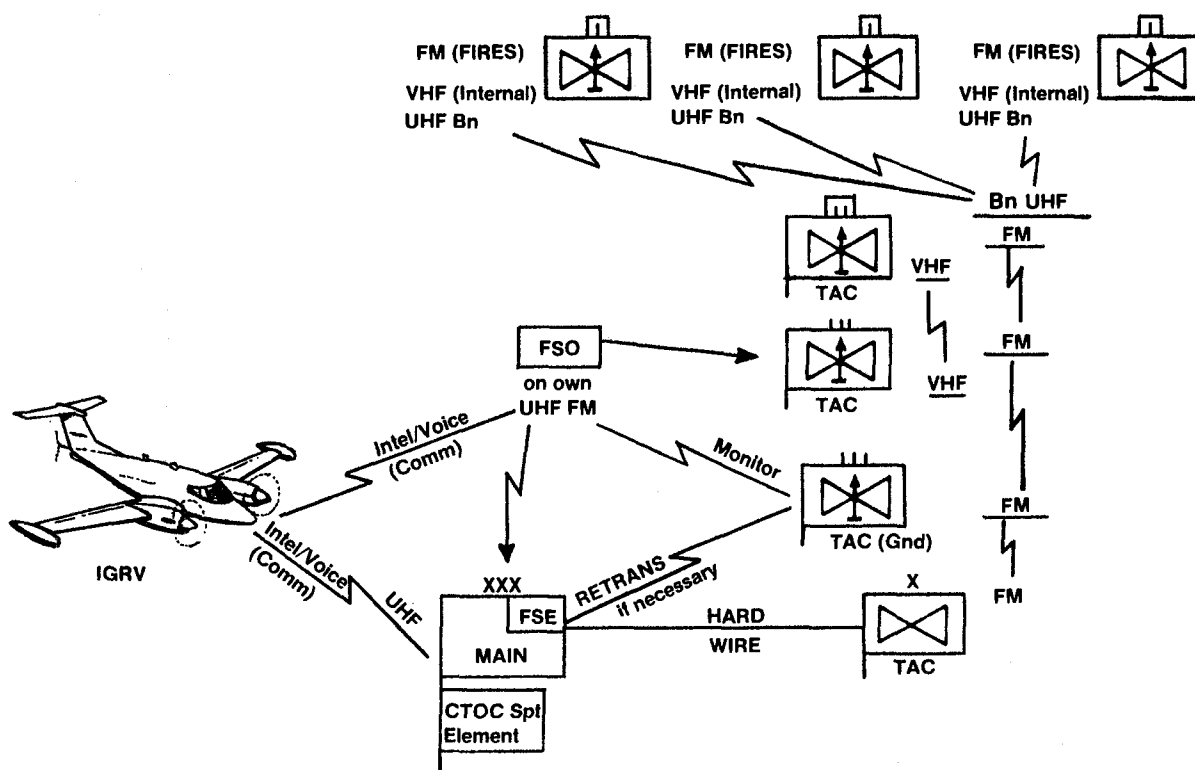


Figure J-18. Aviation communications

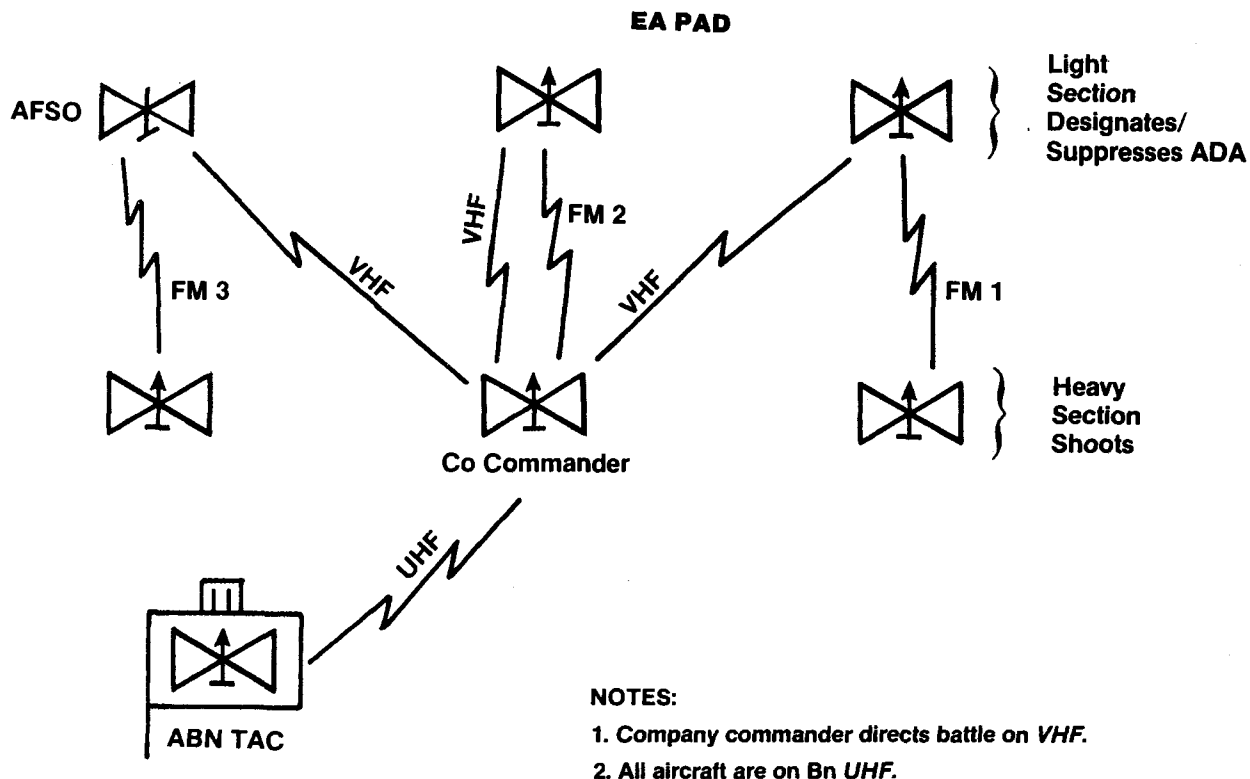


Figure J-19. Company internal communications

(c) Communication between forward-deployed aircraft and CPs is the greatest challenge to ATKHB deep operations. The fluid nature of the battlefield and high-risk nature of this operation require the attack aircraft battalion commander to be able to constantly communicate with the rear CP to receive and relay critical combat information. However, current radio range limitations preclude this communication. In the near future, the only feasible remedy is a retransmission aircraft. The use of the improved Guardrail V is a viable option. The Guardrail will use UHF radio relay from the CTOC to the aviation force commander. Thus constant communications and intelligence updates can be sent to the attack helicopter group; also, the attack group commander and staff will be able to pass information to the corps headquarters through this relay.

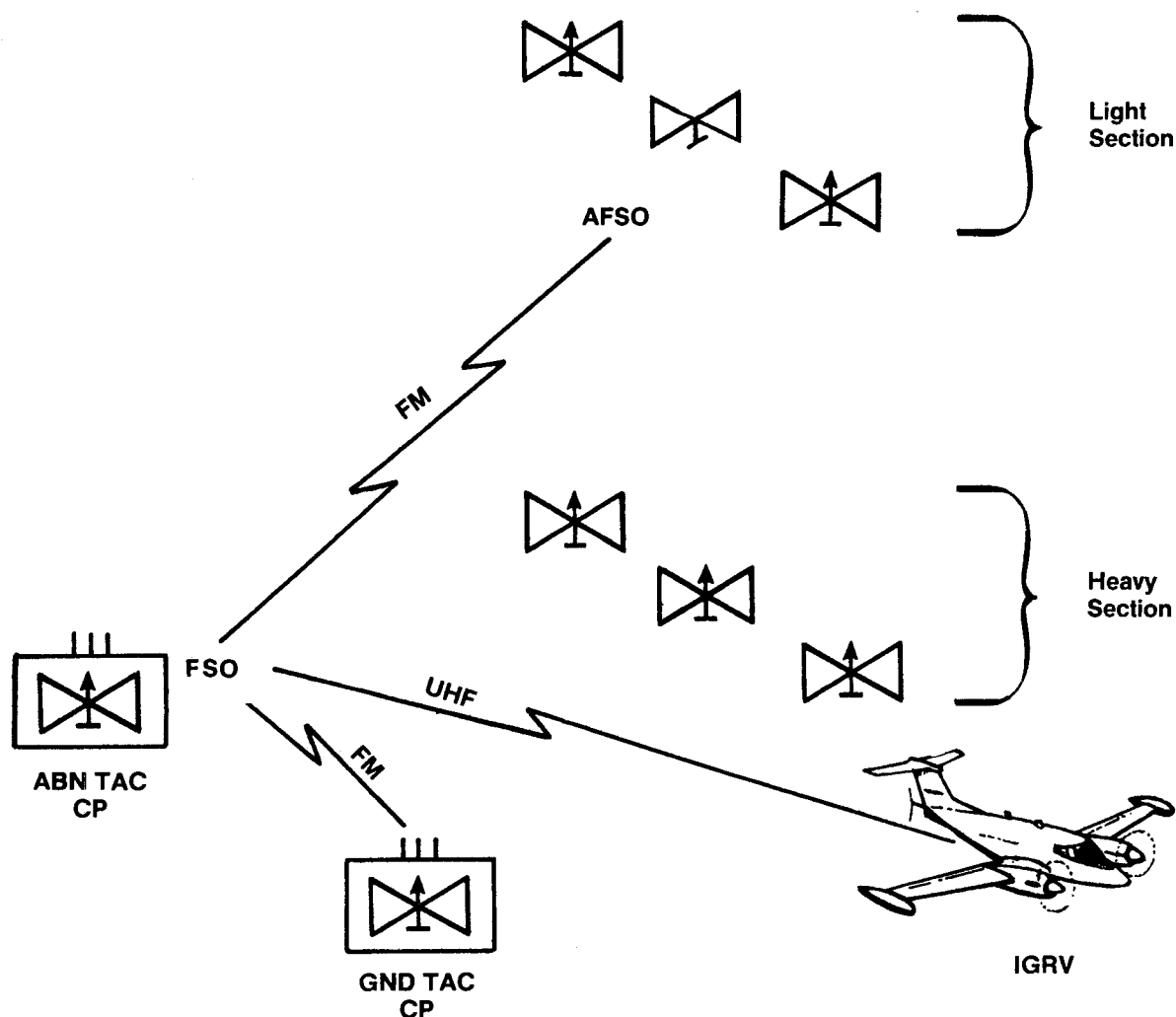


Figure J-20. Artillery request information net

(d) Synchronization and avoidance of fratricide must produce the maximum combat power at the decisive point to defeat the enemy tank regiment in EA PAD. This mission depends on the availability of the corps staff, aviation brigade, and other elements--individually or collectively--to integrate Army aviation into planning and execution (Figure J-21). Army aviation focuses on the routes, FAAs, holding areas, air check points, and battle positions to synchronize A²C². Synchronization enhances the combat power of the total force by preventing duplicate efforts; thus the enemy in EA PAD can be destroyed.

ELE- MENT	OBJECTIVE/FOCUS	WHO	HOW	WHEN	INTERACTION/ CONNECTIVITY
G2 Intel	Intelligence exchange and coordination	Corps/Div G2 MI Bde, Corps MI Bn, Div	Select correct sensors Employ properly at correct time	Constant	Intel system—all levels
		G2 BCE USAF	At ATOC/Corps HQ	Constant	JFACC & Army requirements
Weather		All	MSE	Constant and when required	All air & ground
G3 Plans Ops	Synchronize scheme of maneuver with air campaign	BCE	Locate with USAF — TACC/ATOC	Constant	Air & ground maneuver all levels
FSE	Effective, timely, and accurate artillery fires	G3 A ² C ² BCE FSE	MSE, LO	As required	All air & ground units in area of operations
Army Aviation	Routes/alt from corps rear to FAA Routes/alt from FAAs to EA and return HAs, ACPs, BPs	A ² C ² BCE FSE	Info from unit Info to USAF Info to BCE/A ² C ²	H-24	Complete air & ground connection to affected units
G4	Synchronize large fuel and ammo requirements Accelerate parts and supply related to aircraft repair			H-96 (starts)	
USAF	BAI/AI targets Airspace	w/BCE G3 A ² C ²	MSE LO	Constant/ATO (ACO) cycle	All air & ground

Figure J-21. Synchronization

(e) The corps A²C² element coordinates, integrates, and regulates the corps airspace. For the cross-FLOT operation, the aviation brigade commander must coordinate employment of his assets according to the airspace command and control plan. To prevent engagement of his friendly AD forces, the commander must exploit the existing C³ structure. He must also require his forces to adhere to directed control measures (Figure J-22).

(f) EA PAD has been designated a high-intensity airspace control zone, which is controlled by corps. The attack group has received a special corridor from the corps rear area to the BPs near EA PAD. This special corridor is large enough for the aviation group's air corridors. Restricted operating zones have been established for SLAR and Guardrail to support aviation deep operations. The BCE has planned BAI ROZ scheduled to be implemented after the aviation deep operation.

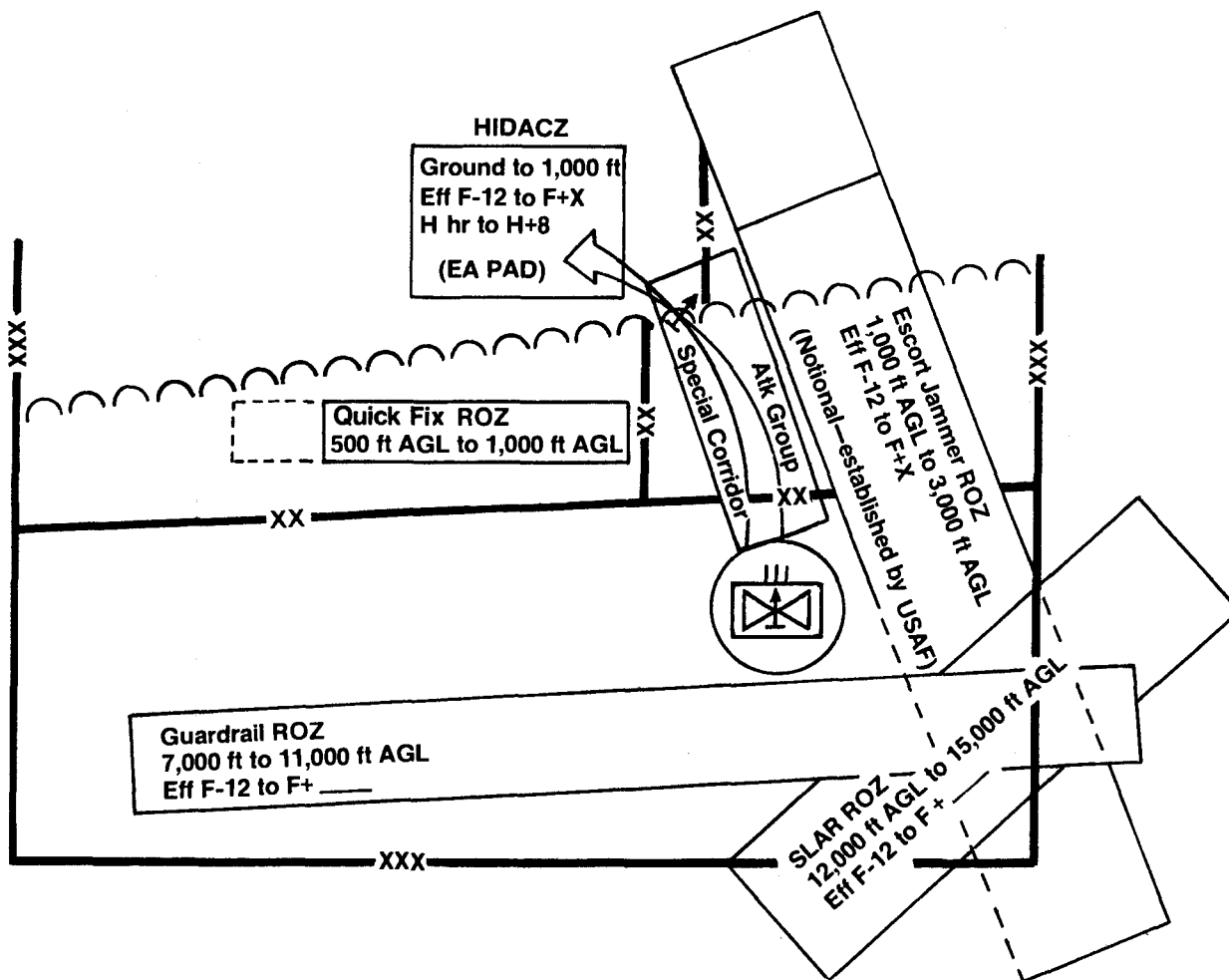


Figure J-22. A²C² plan

(g) Figure J-23 shows the aviation brigade's airspace for the deep attack. EA PAD ROZ has an attached BAI box. BAI is to be implemented after the aviation deep attack ends. SEAD targets have been designated as airspace coordination areas to keep the aircraft from overflying probable impact areas. An airspace coordination area has been established around the downed aircrew pickup point. The area protects aircrews and rescue personnel from friendly fires. The AD weapons control status in the special corridor is "weapons hold." These control measures will ensure that air and ground maneuver forces are synchronized.

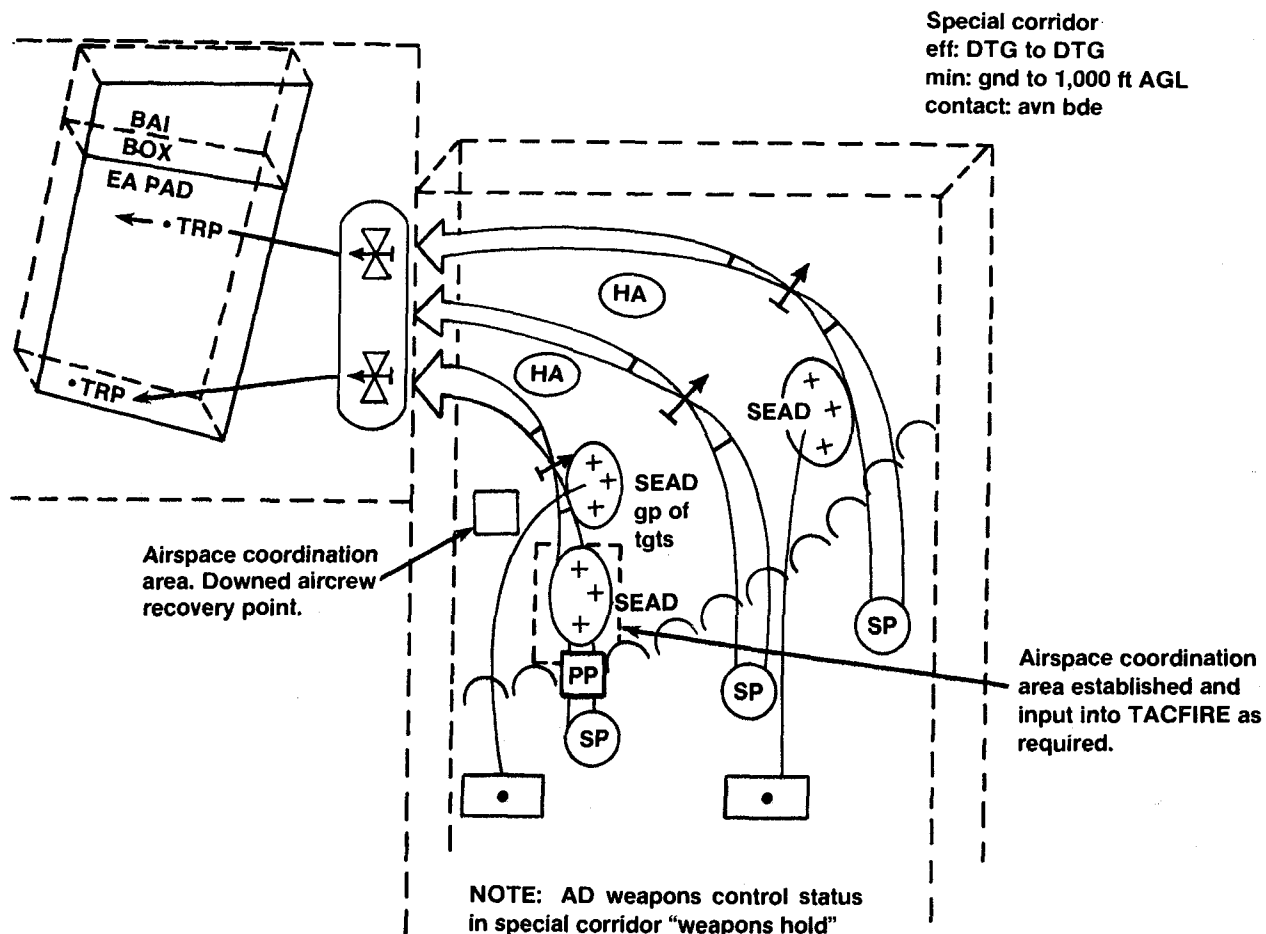


Figure J-23. Control measures

(7) Execution matrix. An execution matrix is established to synchronize execution. It includes intelligence; aviation maneuver; fires; USAF; and command, control, and communications. The matrix includes the time line in relation to the decision support template and cross-FLOT penetration (F hour). It also includes such key events as identifying the tank division at the NAI and implementing the event sequence. The anticipated attack window begins at EENT (1900). It ends at 0300 with ATKHBs returning by BMNT (Figure J-24).

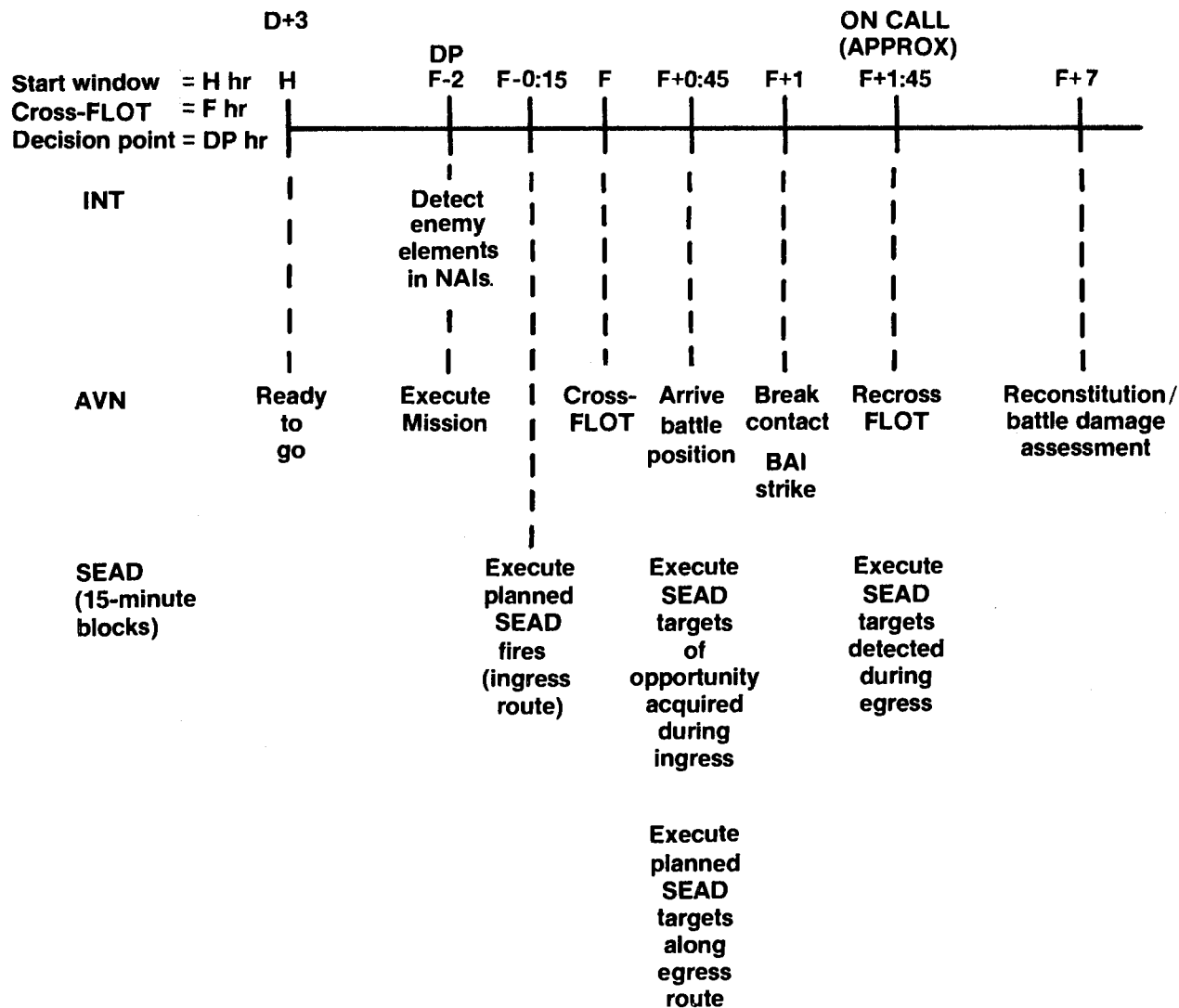


Figure J-24. Event sequence EENT through BMNT

(8) Assessment of new and additional PIR against current PIR. The G2 section--ASPS and CM&D--continue the IPB. The situation is further developed. At the same time, the isolation of high-payoff targets is assessed; also, collection tasks are finalized for corps and division assets (Figure J-25).

ASSESS NEW PIR AGAINST CURRENT PIR

Identification of newly located AD units
 Identification of new units in corps area
 Current loc/acty of tank div

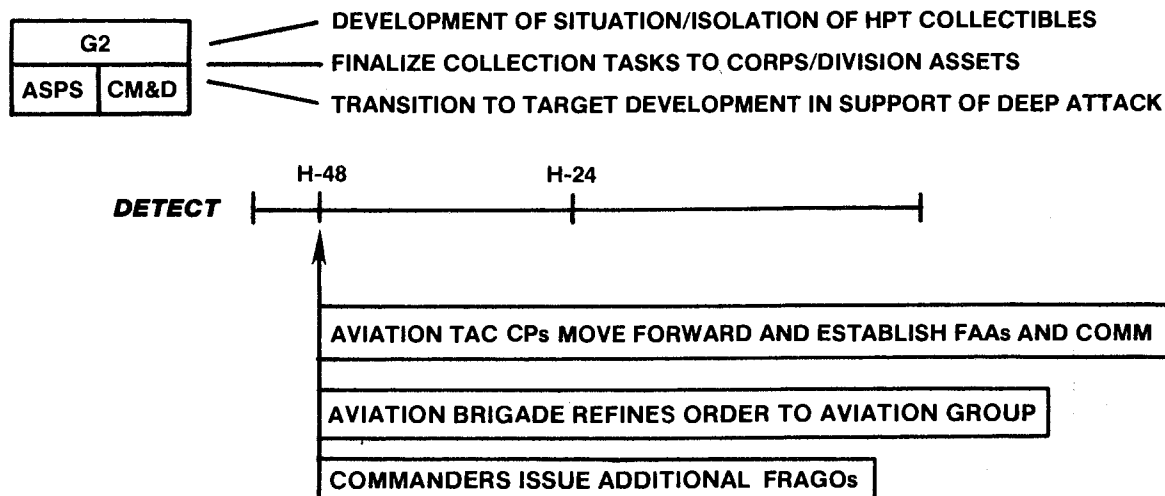


Figure J-25. Event sequence

(a) Target development continues in support of the deep attack. At about H-48, the aviation group tactical CP moves forward and establishes communications. The movement of the tactical CP should occur at night. The final aviation brigade order is also issued to the attack helicopter group. Detailed FRAGOs follow; updates are provided.

(b) The collection plan is revised at about H-24. This revision is based on the chosen course of action and high-payoff target list. The drive to target acquisition begins. Specific targets are focused on; target locations are refined that are within the tolerance of weapon systems to be used against each specific target. A matrix is developed to support the coordination and execution of SEAD. The matrix will also support the deep attack of the tank division. The matrix is reviewed by the corps G2 (CM&D section). Figure J-26 shows an example of a target matrix.

(c) The collection plan must support both target development and acquisition and situation development. Agencies must be tasked and sensors requested to support this plan. Then new SORs are developed and sent out to the agencies listed in Figure J-27. Sensors and processors are focused electronically or physically; these begin to isolate targets in time and space. The analysis effort concentrates on targets on the HPT list.

DESCRIPTION	WHEN	HOW	BDA	REMARKS
SA 6/8	F-0:15	FS/EW		Coord attack with avn bde
SA 9/13	F-0:15	FS/EW		Coord attack with avn bde
SA 11/12	Immediately	FS/EW/USAF		
ZSU 23-4/2S6	F-0:15	FS/EW		Coord attack with avn bde
Tank div	F+0:45 to F+1:00	Aviation	X	In/along TAI

FS = MLRS/ATACMS Blk 1
 EW = Army/USAF jammers
 AVN = Army aviation

Figure J-26. Example of a target matrix

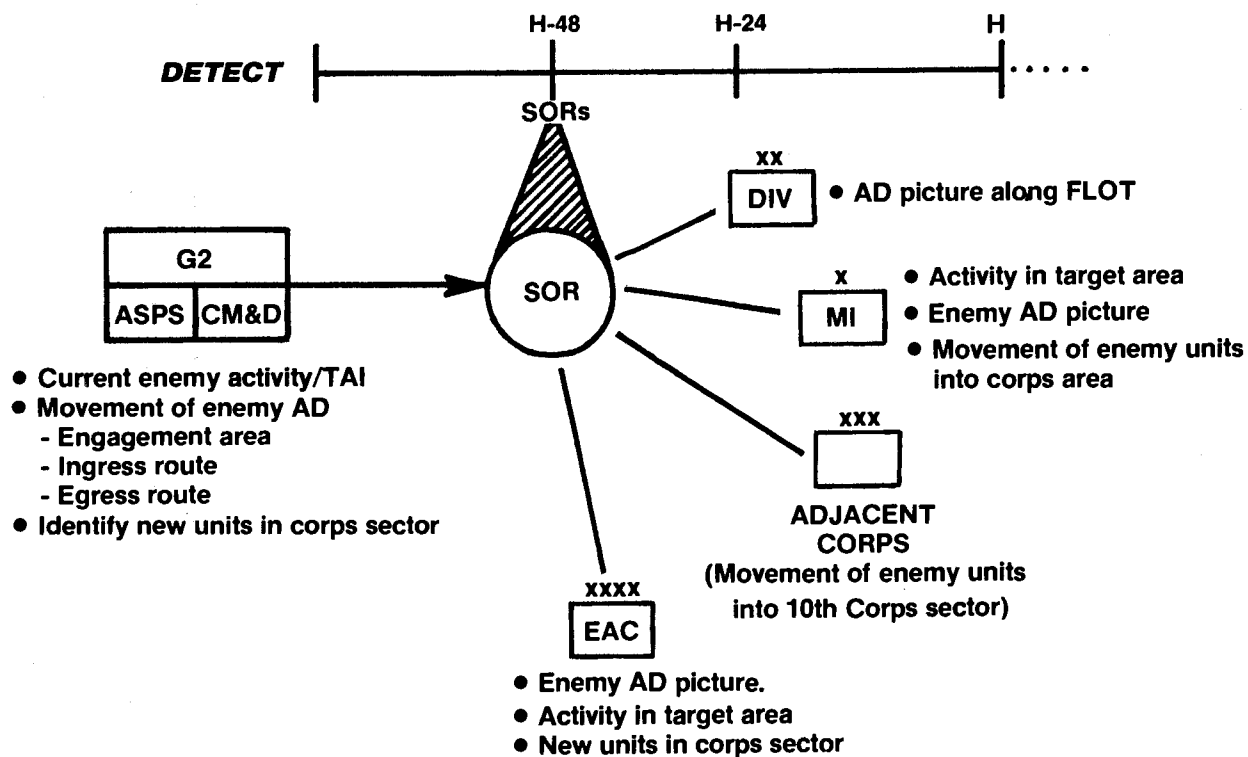


Figure J-27. New tasking implementation

(d) The aviation brigade requires substantial logistical base augmentation, especially in fuel and munitions, to sustain combat operations. All aviation maintenance and support functions must be tailored to support aviation deployments and operations.

(e) While in the corps rear area, the GS maintenance battalion, aviation maintenance battalion, and contact teams provide continuous support on an area basis (Figure J-28). During the deep attack preparation phase, a portion of each support element moves forward with the aviation elements. Corps planners must coordinate the space for support elements in the division rear area.

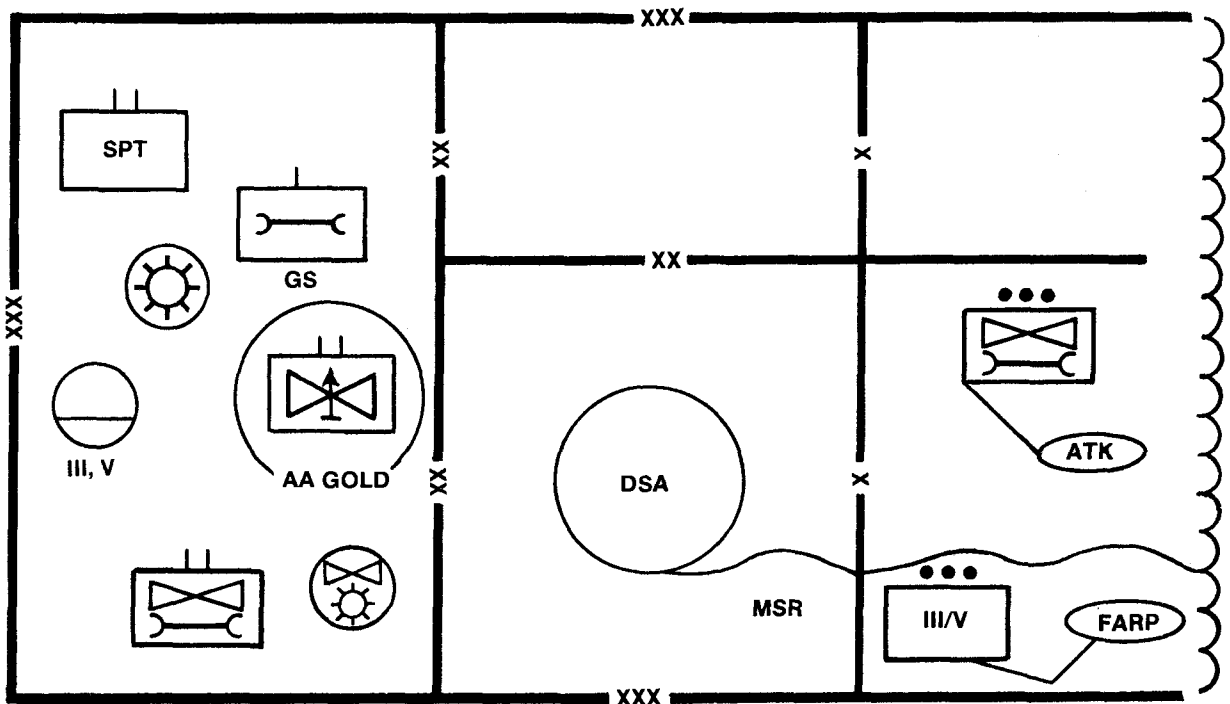


Figure J-28. Aviation sustainment preparation

(f) As H hour approaches, CS and CSS elements move to their designated locations. Intelligence units position to support the deep attack. Sensors identified are on-station as the sequence begins. The aviation brigade and the FSE receive final updates to revise the SEAD plan.

(g) The preparation phase closes at H hour; the ATKHBs will be in their FAA positions (Figure J-29). The aircraft will turn off their IFF transponders as they cross the IFF OFF line. (This line is established by the airspace command and control element after coordination with the ASOC and other activities.) The attack helicopter group tactical CP locates near the ground brigade main CP. This proximity enhances terrain management and ultimately the forward and rearward aerial passage of lines. Air defense weapons

status and artillery fires (SEAD) receive final coordination and verification. Three MLRS batteries have been moved forward to support SEAD. The ATKHB is now in the FAA awaiting the start of the F-hour sequence.

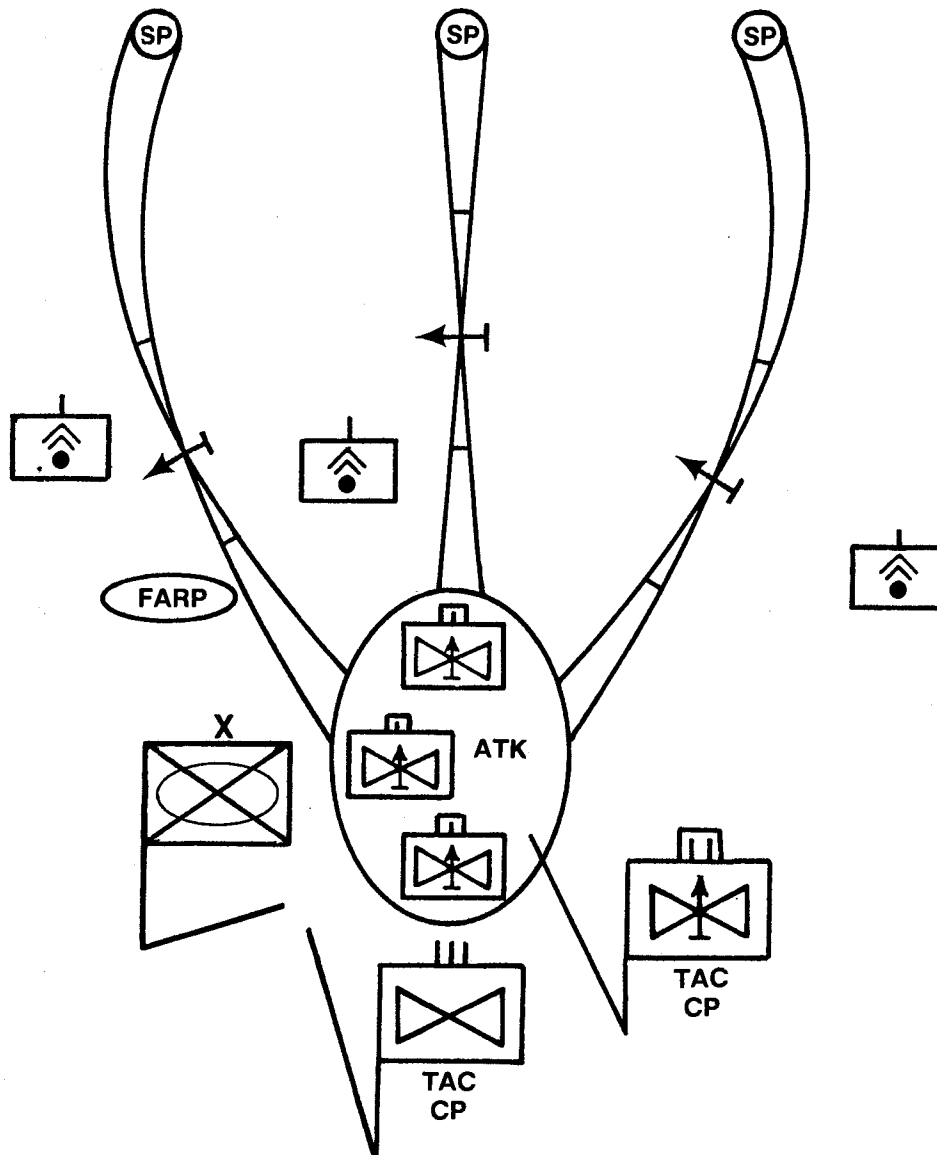


Figure J-29. H hour in position--ready-to-attack window opens

(9) Event sequence.

(a) The decision to attack is selected based on the enemy's projected rate of movement and the time anticipated for a synchronized response from the corps. The corps staff's final coordination and verification are based on actual time; this time then becomes the basis for the attack helicopter units crossing the line of departure or the artillery units shooting their first SEAD missions.

(b) Mohawk (SLAR) and LRSU teams are expected to detect the tank regiments of the targeted tank division in the NAIs. SLAR information is relayed from the platform to the ground station module (LPU) via the onboard imagery data link; the LPU is located in the MI brigade operations center. The LRSUs relay their intelligence to the corps main CP via IHFR. Information is then relayed via landline from the G2 to the G3 (Figure J-30). Decisions are made to attack according to the event sequence based on actions at the decision points. The cross-FLOT penetration time, or F hour, is also established at this time. MSE and FM radio are among the means of disseminating orders to execute the sequenced events. The corps commander will have established checks to monitor and control units executing their sequenced tasks. The penetration of the FLOT by the aviation group is now two hours away.

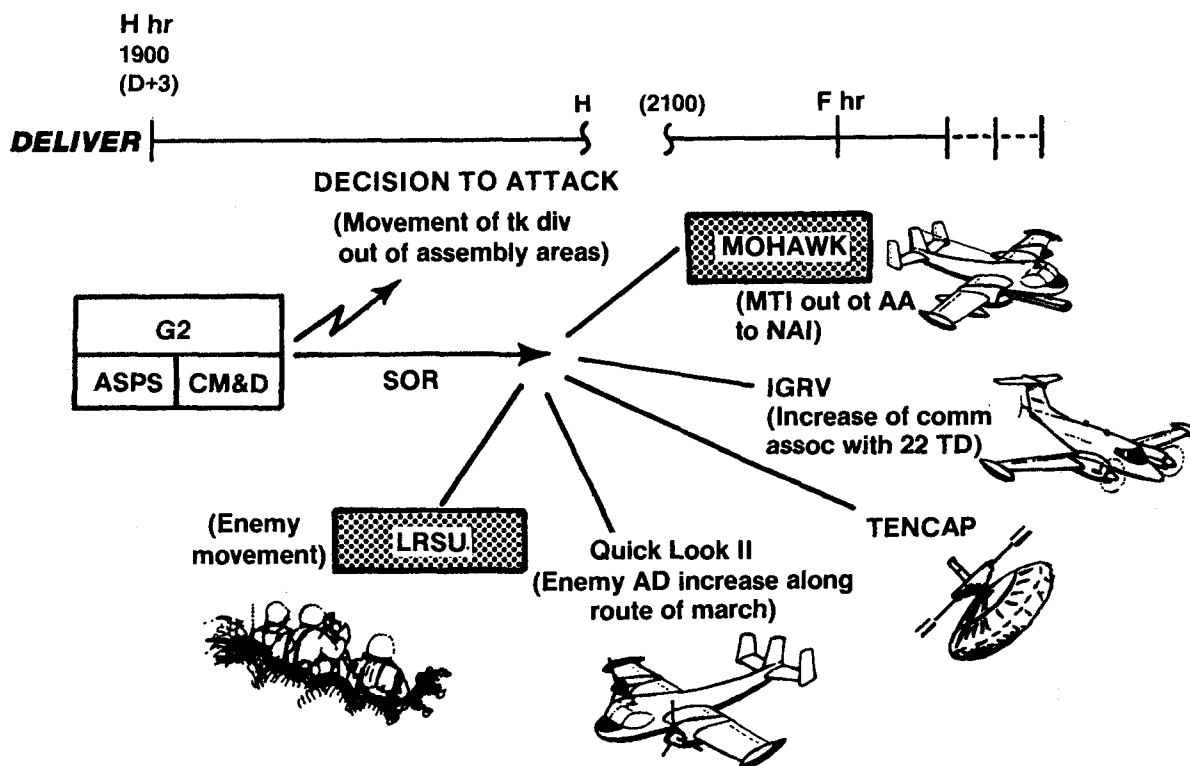


Figure J-30. Event sequence

b. Penetration.

(1) An aviation cross-FLOT operation is a combined arms maneuver mission; it requires the support of all arms. All corps units involved with the battle must participate in planning and coordination to preclude fratricide. The corps must coordinate the passage points with the division to expedite the passage of lines. This operation requires a plan for a series of fires integrated into a strict time sequence. This sequence includes multiple crossing points, a ground feint, and an aerial ruse at the crossing

site to divert enemy radar and attention. The fire support plan for this operation is planned in detail to assist in crossing the FLOT. The fires should be scheduled so that they begin before forces cross the FLOT and end before the lead aircraft arrives at the FLOT; the COMJAM should end as aviation units leave friendly artillery range. ELINT jamming continues until the aviation unit returns. Aviation planning requires tactical maps that reflect mission graphics, to include--

- Times.
- Routes.
- Hazards.
- Headings.
- Distance.
- Airspeed.
- Altitudes.
- Doppler waypoint.
- Known or suspected enemy locations.

Route separation considerations should include the separation of company flight paths by as much as 3 to 5 kilometers. This separation improves survivability; a single threat system is thus less likely to acquire and destroy the entire attack force. A holding area short of the FLOT is planned in case the operation is delayed after attack companies depart the assembly area. A²C² may require that all cross-FLOT routes be combined into one corridor.

(2) Key strengths of the AH-64 ATKHB are the speed, mobility, and capability to operate in darkness and in low visibility. All of these enhance the battalion's survivability. They also improve its prospects of maintaining stealth and surprise. Route planning, both forward and behind the FLOT, is based on terrain that limits the enemy's direct fire potential and conceals aircraft from electronic, radar, and visual acquisition. Doppler is the key navigational aid in the AH-64. However, it must be updated constantly using known terrain points. To compensate for this deficiency, the pilot uses map and compass information.

(3) Use of the OH-58C is limited; it lacks suitable night, weather, and targeting systems. It also is unable to keep pace with the AH-64. However, the OH-58C may perform important functions to support crossing the FLOT. First, it can conduct liaison with ground units and other supporting elements. Second, it can conduct reconnaissance and security of the routes to and from the FLOT. Third, it can coordinate the FARP location. The scout aircraft may go forward early; or it may lead the attack force to FLOT passage points. At F-15 minutes, as the SEAD operation begins, the attack companies move forward from the FAA to identify the passage points.

OH-58C aircrews coordinate the forward and rearward passage of lines. They ensure that the passage point location is correct. They also ensure that the local AD fire control status has been adjusted for the passage of friendly aircraft. The aircrews establish physical contact with the unit on the ground near the passage point; they inform the unit of the time that aircraft should arrive and how many aircraft are coming. The passage point teams may even give a visual signal to the AH-64s as they pass through the FLOT; this signal provides a known point on the ground for a Doppler update. The OH-58C aircraft must not give away the locations of passage points.

(4) As the aviation unit prepares to cross the FLOT, the aviation brigade tactical CP receives intelligence updates; critical information will be sent over the Guardrail relay. The FSE updates the SEAD plan from constant updates on the enemy AD picture. At this time, some intelligence collection shifts to the engagement area.

(5) Scout aircraft move to the return passage points; there, they coordinate crossing of the FLOT and provide security for AH-64s, UH-60s, and OH-58Ds recrossing the FLOT. The UH-60 may be employed as an airborne tactical CP.

(6) Once past the FLOT, the attack force must execute a precise plan. Each member of the attack force must be briefed on contingencies that may arise as the tactical situation changes. Speed is essential as the AH-64s penetrate the FLOT and proceed forward to the engagement areas. Avoidance or rapid suppression of enemy fires and continued movement to the objective area are key to mission timing and synchronized arrival into battle positions as the enemy enters the engagement area. The degree of separation between aircraft is normally a decision based on visibility and terrain.

(7) The speed and altitude used by attack helicopters are related to the threat, weather, and terrain. Figure J-31 depicts the action associated with the penetration. The lead company or troop may be required to immediately suppress enemy systems that threaten the force while en route to the objective. Another option is for the OH-58D to initiate fire requests via TACFIRE to the firing artillery unit. Once out of TACFIRE digital communication range, the FSO (UH-60) passes fire missions via voice FM or UHF (Guardrail) to the CTOC. At the CTOC, the FAIO will ensure that no conflict occurs between maneuver unit movement and artillery fires passed to firing artillery units.

c. Movement to the Objective. During the movement to the objective, intelligence updates the AD picture as the aviation attack continues. AD concentrations or significant changes are reported to the attacking units over the Guardrail relay. Current activity of the tank division is also reported over the Guardrail relay.

(1) The light attack team will reconnoiter the route holding areas and battle positions. Then it will maneuver to forward battle positions so that it can visually acquire and identify targets (Figure J-32).

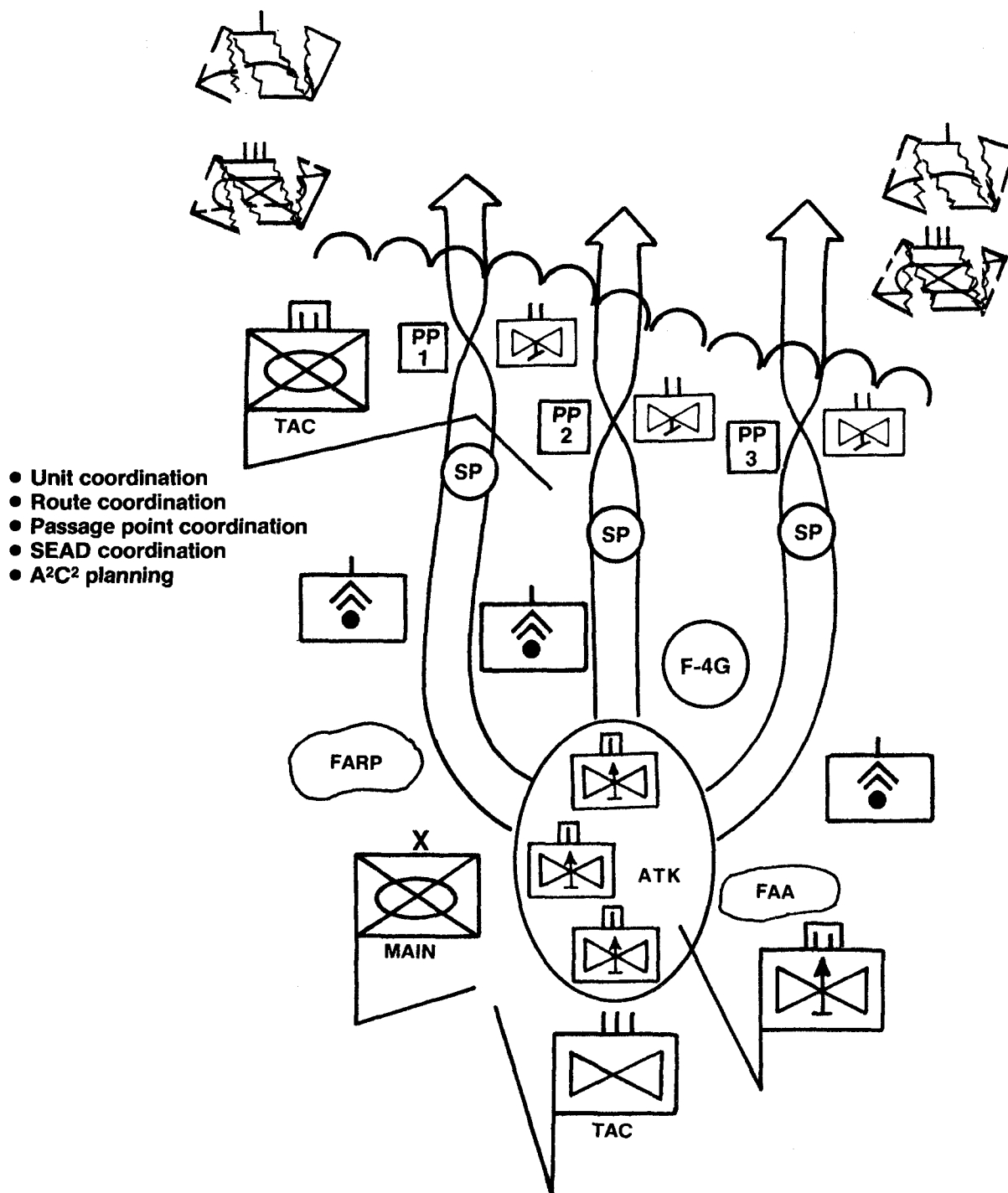


Figure J-31. Penetration phase

(2) The attack helicopters will engage targets from concealed battle positions that are designated in the operation order. BPs are selected in relation to the engagement area from a careful map study and kill zone

analysis. Mutual support, overlapping coverage, and the laser-to-target line are primary considerations. In deep operations, the occupation of battle positions may be difficult because they have not been reconnoitered and secured. How the AH-64 disperses within a BP is terrain-dependent. BPs have to be adjusted significantly to obtain optimum fires on targets. The BP must be secured while it is occupied. Crews are assigned sectors of responsibility for periodic air and ground sweeps. Regular scans will help to prevent an enemy surprise attack from a blind side. If the tactical situation dictates, a portion of the force may be totally dedicated to the security mission.

FSCL

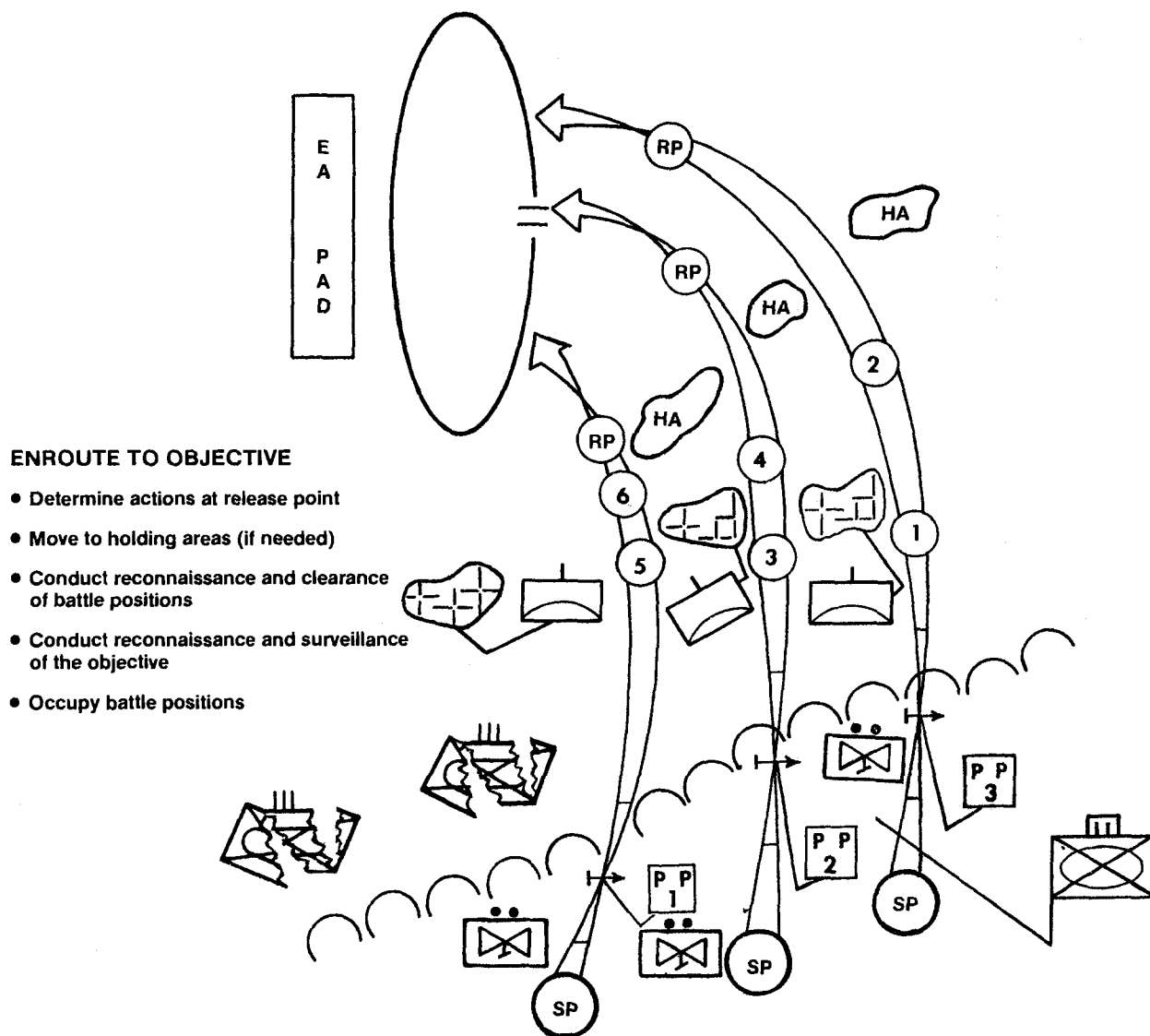


Figure J-32. Attack helicopter battalion's movement to EA PAD

d. Actions at the Objective.

(1) Intelligence collection at the objective. As the aviation unit arrives at the objective, all sensors report current activity in the objective area.

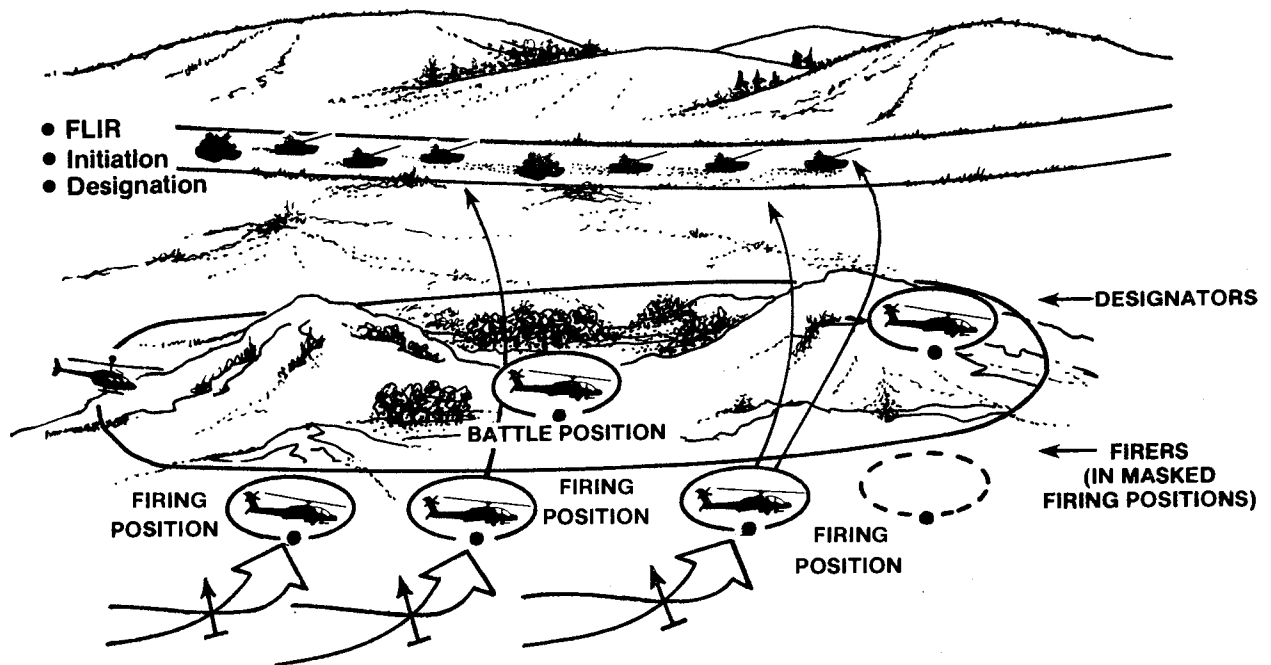
(2) Target engagements. The engagement is best begun by using heavy team AH-64 remote fires. These fires optimize surprise, confuse the enemy, and allow the commander to better assess the target array. The light team designators may then fire autonomously; they use complementary engagement techniques to suppress enemy ADA. If surprise is achieved and a target-rich environment is observed, the company commander should consider moving the heavy team forward; then he can direct all aircraft to engage autonomously to further reduce total engagement time.

(3) Fire distribution and control. Well-established target engagement techniques and procedures in which personnel have been thoroughly trained result in optimum kills in the engagement area with less exposure to enemy fires. When surprise is achieved, as many targets as possible should be rapidly developed in the assigned order of priority. To prevent multiple shots on the same target, each battalion TF must adhere to the fire distribution plan (Figure J-33). The EAs should be broken down into smaller kill zones for pre-positioning the TADS; battalion or company boundaries should follow or cross an easily identifiable terrain feature (Figure J-34). Each company will be assigned a company kill zone; this zone will, in turn, be divided into smaller areas for each attack helicopter. Essentially, the left shoots left, the right shoots right, and the center shoots center.

e. Return. While the attack unit engages the target, intelligence collection begins to shift to the egress route. Locations of enemy AD radars that have been illuminated during the attack will be passed to the FSE to update the SEAD plan. Any new concentrations of enemy AD will be reported to attacking units.

(1) Withdrawal from the objective. As the heavy team reports "ordnance expended," the light team provides massed rocket fires to allow the attack force to break contact with the enemy. The light force will be loaded mainly with a mix of high-explosive, white phosphorous, and multipurpose submunitions and Hydra-70 rockets.

TARGET ACQUISITION AND ENGAGEMENT



FIRE DISTRIBUTION AND CONTROL

- SOPs
- Graphics
- Laser designator
- Unit intervals

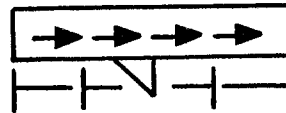


Figure J-33. Target acquisition and engagement and fire distribution and control

(2) Return route and rearward passage of lines. Return to and reentry through the FLOT (Figure J-35) differ chiefly in the selection and use of different egress routes and the use of onboard ASE. The corps must now coordinate the passage of lines by changing the AD weapons status of the ground maneuver units. ASE and IFF systems will be employed to the maximum to defeat all possible Threat AD systems during the penetration of the FLOT. Immediately after recrossing the FLOT, companies assemble at designated holding areas for sequencing into the FARP.

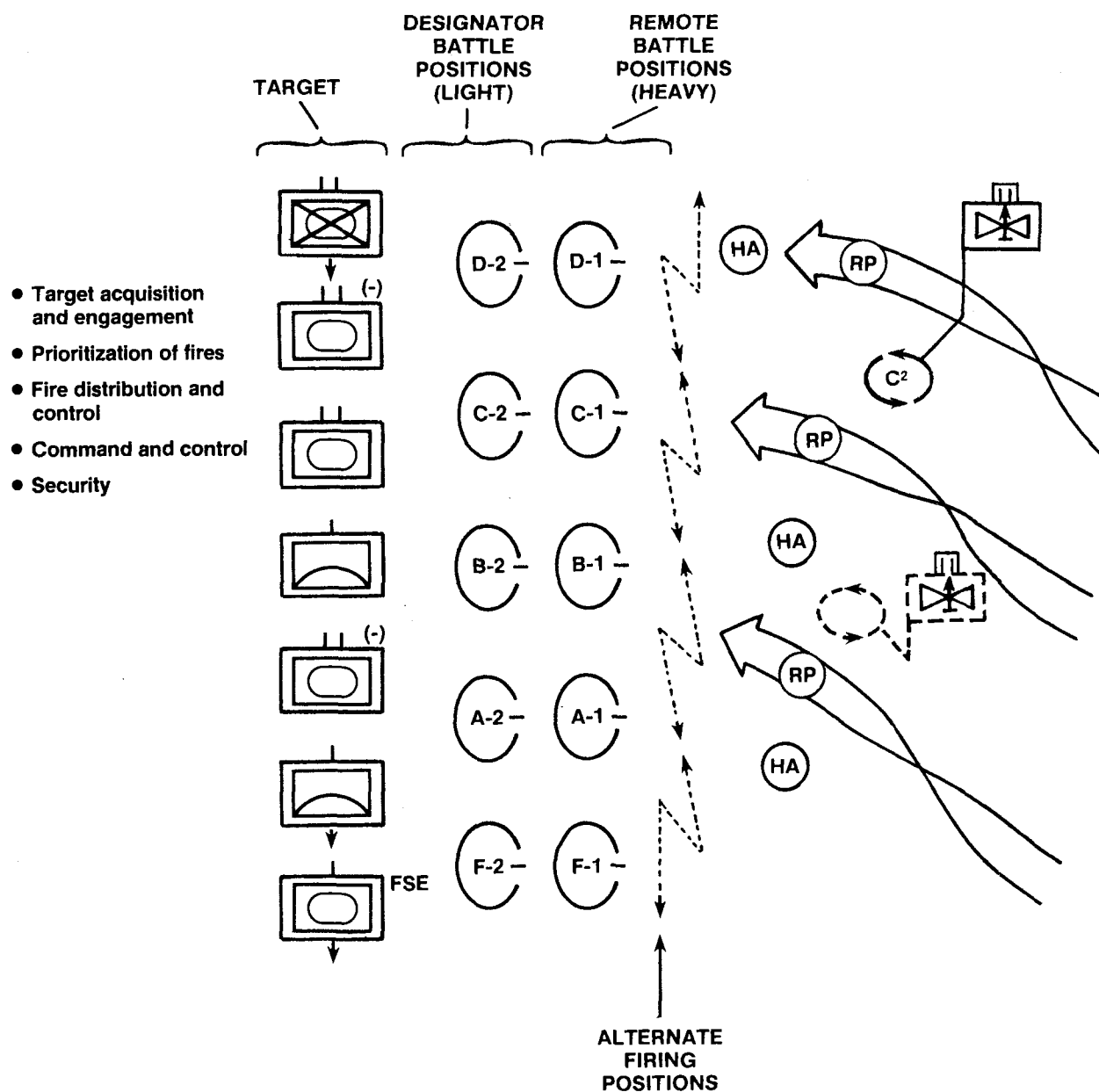


Figure J-34. Actions at the objective

(3) Battlefield damage assessment. The LRSU starts the BDA as soon as the return phase begins. Sensors obtain intelligence for the corps to estimate the enemy's combat effectiveness. They also provide probable courses of action and a window of opportunity for friendly maneuver deep fires.

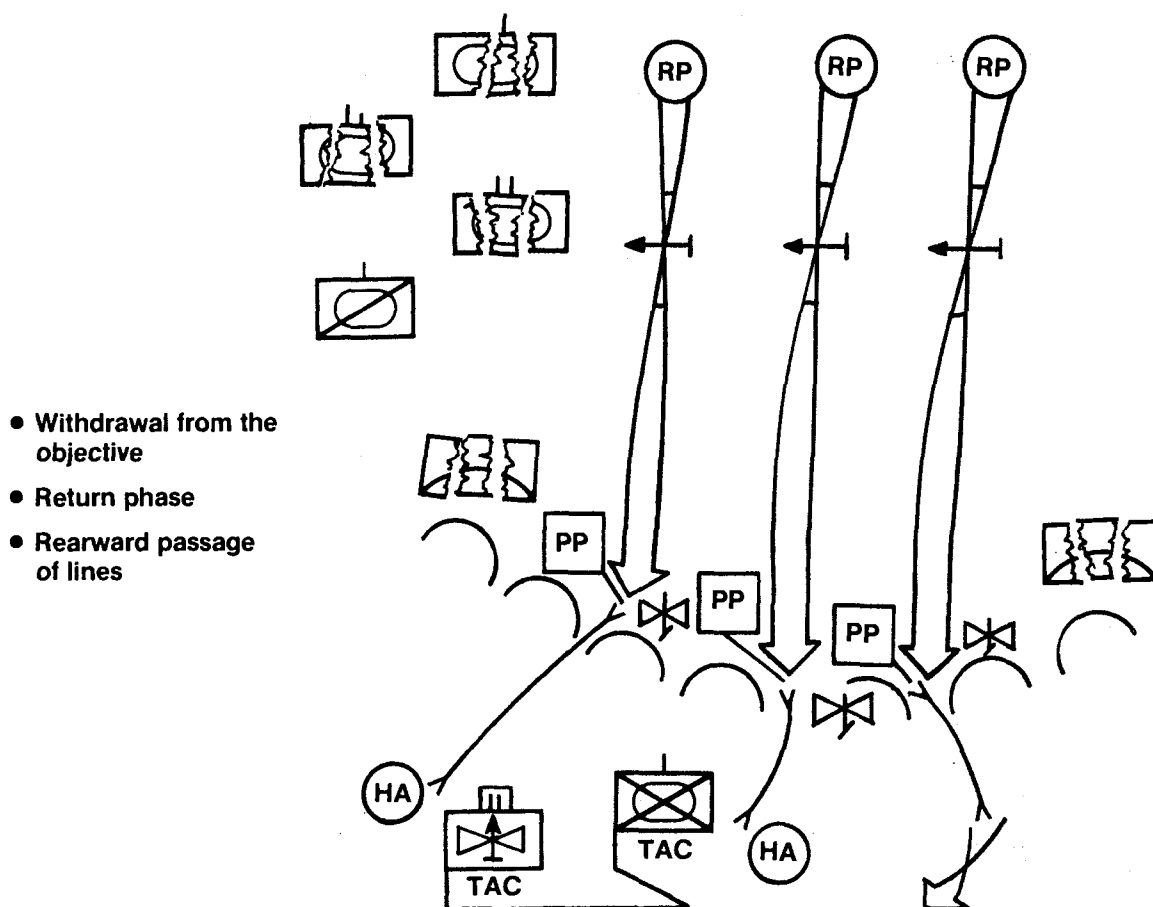


Figure J-35. Return phase

f. Reconstitution and BDA. After FARP operations end and the battalion has moved out of artillery range, the attack battalion debriefing occurs. It involves not only the commander and members of the aviation brigade and group staff but also personnel from division and corps.

(1) The attack helicopters perform postflight checks. These checks determine whether aircraft need repair before they are sent from the FAA to the corps rear area. The entire battalion staff will be involved in the recovery. The battalion quickly moves back to the assembly area in the corps rear area where CSS can be focused on the battalion. The ATKHB will require 24 to 48 hours to prepare for another deep operation (Figure J-36).

(2) All available sensors turn to BDA. They determine the results of the attack and the enemy commander's reaction. Combat effectiveness of the 22d GTD must be ascertained. Thus the corps planning staff will know the options the enemy army commander now has; for example, committing the

22d GTD as is, reconstituting and continuing the attack, or forcing an early commitment of an element of the 25th Tank Army. The attack on the 22d GTD starts the planning cycle again; the attack and its effect on the corps commander's campaign plan must be evaluated.

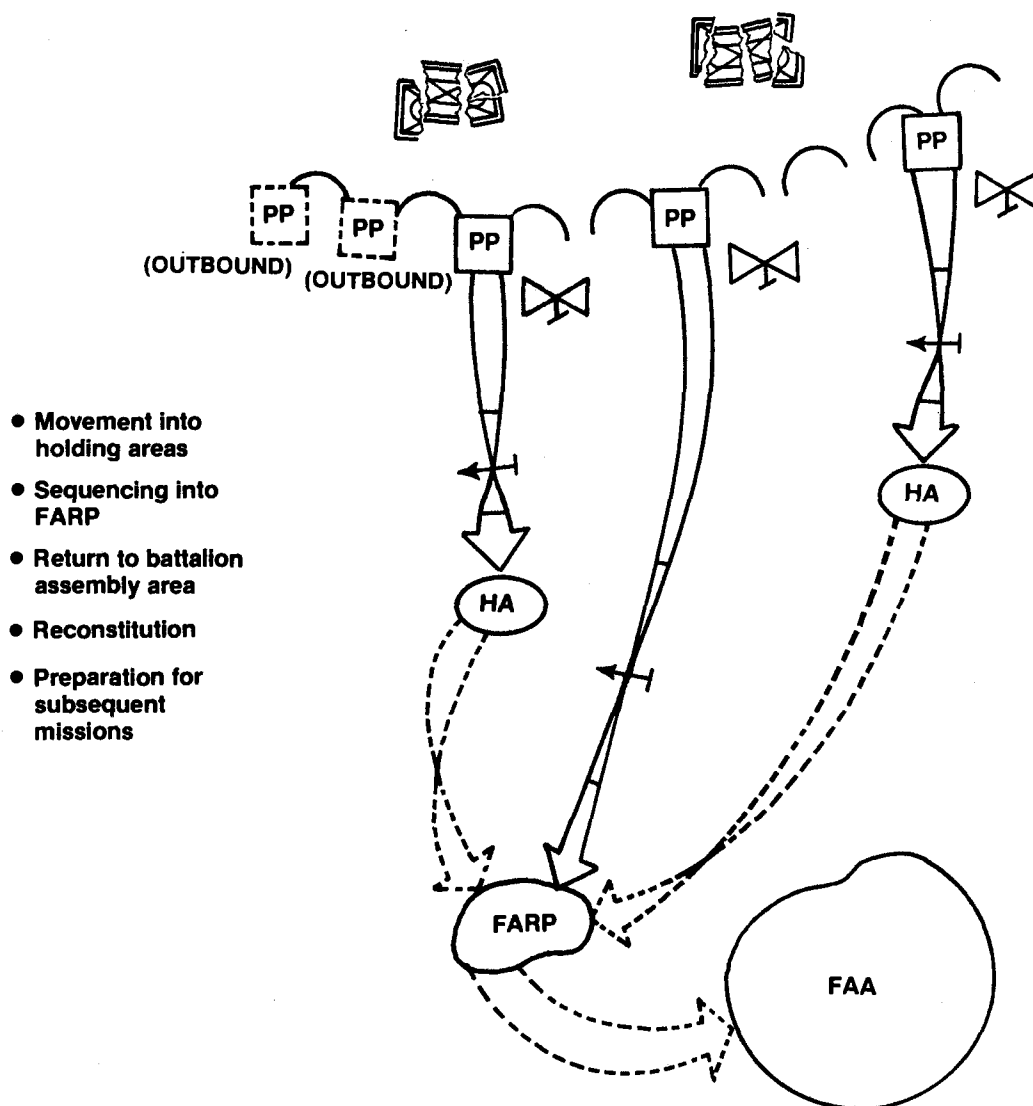


Figure J-36. Reconstitution

REFERENCES

Section I

REQUIRED PUBLICATIONS

Required publications are sources that users must read in order to understand or to comply with this publication.

ARMY REGULATIONS

- | | |
|--------|---|
| 95-1 | Army Aviation: Flight Regulations |
| 350-42 | Nuclear, Biological, and Chemical Defense and Chemical Warfare Training |
| 385-10 | Army Safety Program |
| 600-20 | Army Command Policy |

FIELD MANUALS

- | | |
|-------|---|
| 1-100 | Doctrinal Principles for Army Aviation in Combat Operations |
| 1-101 | Aircraft Battlefield Countermeasures and Survivability (ABCS) |
| 1-103 | Airspace Management and Army Air Traffic in a Combat Zone |
| 1-107 | Air-to-Air Combat |
| 1-112 | Attack Helicopter Battalion |
| 1-113 | Assault Helicopter Battalion |
| 1-117 | Air Reconnaissance Squadron |
| 1-301 | Aeromedical Training for Flight Personnel |
| 1-500 | Army Aviation Maintenance |
| 3-3 | NBC Contamination Avoidance |
| 3-4 | NBC Protection |
| 3-9 | Military Chemistry and Chemical Compounds |

3-50	Deliberate Smoke Operations
5-100	Engineer Combat Operations
6-20	Fire Support in the AirLand Battle
6-20-2J	Division Artillery, Field Artillery Brigade and Corps Artillery Headquarters
8-9	NATO Handbook on the Medical Aspects of NBC Defensive Operations
11-50(HTF)	Combat Communications Within the Division (How to Fight)
17-95	Cavalry Operations
19-1	Military Police Support for the AirLand Battle
20-22	Vehicle Recovery Operations
21-11	First Aid for Soldiers
22-9	Soldier Performance in Continuous Operations
34-1	Intelligence and Electronic Warfare Operations
34-3	Intelligence Analysis
34-60	Counterintelligence
34-80	Brigade and Battalion Intelligence and Electronic Warfare Operations
34-81	Weather Support for Army Tactical Operations
34-130	Intelligence Preparation of the Battlefield
44-8	Small Unit Self-Defense Against Air Attack
55-9	Unit Air Movement Planning
55-20	Army Rail Transport Units and Operations
55-30	Army Motor Transport Units and Operations
55-413	Aerial Recovery of US Army and Air Force Aircraft
71-100(HTF)	Armored and Mechanized Division Operations (How to Fight)
90-2	Battlefield Deception
90-4	Air Assault Operations

100-2-1	Soviet Army Operations and Tactics
100-5	Operations
100-10	Combat Service Support
100-15	Corps Operations
100-16	Support Operations: Echelons Above Corps
100-20	Low Intensity Conflict
100-42	US Air Force/US Army Airspace Management in an Area of Operations
100-103	Army Airspace Command and Control in a Combat Zone
101-5	Staff Organization and Operations
101-31-1	Staff Officers' Field Manual: Nuclear Weapons Employment Doctrine and Procedures

SOLDIER TRAINING PUBLICATION

21-1-SMCT	Soldier's Manual of Common Tasks (Skill Level 1)
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TECHNICAL MANUALS

1-1500-328-25	Aeronautical Equipment Maintenance Management Policies and Procedures
3-4240-280-10	Operator's Manual for Mask, Chemical-Biological: Aircraft, ABC-M24 and Accessories and Mask, Chemical-Biological, Tank, M25A1 and Accessories

TRAINING CIRCULARS

1-115	Medium Helicopter Battalion
1-210	Aircrew Training Program Commander's Guide
6-40A	Field Artillery Automated Cannon Gunnery
12-17	Adjutant's Call/The S1 Handbook

TABLES OF ORGANIZATION AND EQUIPMENT

01605L1	Theater Army Aviation Bn
01605L2	Theater Army Aviation Bn
01605L3	Theater Army Aviation Bn
01625L0	Theater Army Aviation Co

DEPARTMENT OF THE ARMY FORMS

581	Request for Issue and Turn-In of Ammunition
1594	Daily Staff Journal or Duty Officer's Log
2028	Recommended Changes to Publications and Blank Forms

DEPARTMENT OF DEFENSE FORM

1387-2	Special Handling Data/Certification
--------	-------------------------------------

GRAPHIC TRAINING AID

3-6-3	NBC Warning and Reporting System
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NOTE: GTA 3-6-3 can be obtained from your local training and audiovisual support center. DA Pamphlet 25-37 contains additional information on GTAs.

Section II

RELATED PUBLICATIONS

Related publications are sources of additional information. They are not required in order to understand this publication.

ARMY REGULATIONS

5-9	Intraservice Support Installation Area Coordination
55-1	CONEX/MILVAN Equipment Control, Utilization and Reporting
55-4	CONUS Military Installation Materiel Outloading and Receiving Capability Report

55-9	Overseas Ocean Terminal Handling and Inland Line-Haul Cargo Cost Report
55-23	Submission of Dry Cargo Requirements and the Assignment and Allocation of Sea Transportation Space
55-29	Military Convoy Operations in CONUS
55-36	DOD Use of Domestic Civil Transportation Under Emergency Conditions
55-60	Official Table of Distances (Continental United States, Alaska, Hawaii, Canada, Canal Zone, Central America, Mexico, and Puerto Rico)
55-71	Transportation of Personal Property and Related Services
55-113	Movement of Units Within Continental United States
55-162	Permits for Oversize, Overweight, or Other Special Military Movements on Public Highways in the United States
55-355	Defense Traffic Management Regulation
59-18	Management of System 463L Pallets, Nets and Tie-Down Equipment
59-105	Air Terminals and Aerial Ports
70-47	Engineering for Transportability
190-11	Physical Security of Arms, Ammunition and Explosives
220-10	Preparation for Oversea Movement of Units (POM)
310-25	Dictionary of United States Army Terms
310-31	Management System for Tables of Organization and Equipment (The TOE System)
310-49	The Army Authorization Documents System (TAADS)
310-50	Authorized Abbreviations, Brevity Codes, and Acronyms
350-42	Nuclear, Biological, and Chemical Defense and Chemical Warfare Training
351-1	Individual Military Education and Training
380-5	Department of the Army Information Security Program
700-15	Packaging of Materiel

References-5

- 740-32 Responsibilities for Technical Escort of Dangerous Materials
- 746-1 Packaging of Army Materiel for Shipment and Storage

DEPARTMENT OF THE ARMY PAMPHLETS

- 25-37 Index of Graphic Training Aids (GTA)
- 25-30 Consolidated Index of Army Publications and Blank Forms
- 746-1 Pallets and Storage Aids for Army Use

FIELD MANUALS

- 1-104 Forward Arming and Refueling Points
- 1-114 Regimental Aviation Squadron
- 1-116 Air Cavalry Troop
- 3-5 NBC Decontamination
- 3-6 Field Behavior of NBC Agents (Including Smoke and Incendiaries)
- 5-36 Route Reconnaissance and Classification
- 8-20 (Test) Health Service Support in a Combat Zone
- 10-13 Supply and Service Reference Data
- 10-67 Petroleum Supply in Theaters of Operations
- 10-427 Petroleum Supply Company
- 12-6 Personnel Doctrine
- 16-1 Religious Support Doctrine: The Chaplain and Chaplain Assistant
- 21-60 Visual Signals
- 29-12 Division Maintenance Operations
- 29-51 Division Supply and Field Service Operations
- 34-10 Division Intelligence and Electronic Warfare Operations

41-10	Civil Affairs Operations
42-4	Supply Company, Forward Support Battalion, Armored and Mechanized Divisions
42-7	Supply and Service Company, Main Support Battalion, Armored and Mechanized Division
55-10	Movement Control in a Theater of Operations
55-12	Movement of Units in Air Force Aircraft
55-15	Transportation Reference Data
55-65	Strategic Deployment by Surface Transportation
55-312	Military Convoy Operations in the Continental United States
63-1	Combat Service Support Operations, Separate Brigade
63-2	Combat Service Support Operations - Division (How to Support)
63-2-2	Combat Service Support Operations: Armored, Mechanized and Motorized Divisions
63-3	Combat Service Support Operations - Corps (How to Support)
63-3J	Combat Service Support Operations - Corps
63-4	Combat Service Support Operations - Theater Army Area Command
63-20	Forward Support Battalion
63-21	Main Support Battalion, Armored, Mechanized and Motorized Divisions
90-14	Rear Battle
100-2-2	Soviet Army Specialized Warfare and Rear Area Support
100-2-3	The Soviet Army Troops Organization and Equipment
101-5-1	Operational Terms and Symbols
101-10-1/1	Staff Officers Field Manual - Organizational, Technical, and Logistical Data (Volume 1)
101-10-1/2	Staff Officers Field Manual: Organizational, Technical, and Logistical Data, Planning Factors (Volume 2)

References-7

JOINT CHIEFS OF STAFF PUBLICATION

JCS Pub 1-02 Department of Defense Dictionary of Military and
Associated Terms

SUPPLY BULLETIN

710-2 Supply Control: Combat Consumption Rates for Ground and
Aviation-Type Petroleum Products

TECHNICAL BULLETINS

55-45 Certification of Military Equipment for Transport in
MAC/CRAF Aircraft

55-46-1 Standard Characteristics (Dimensions, Weight, and Cube)
for Transportability of Military Vehicles and Other
Outsize/Overweight Equipment (in TOE Line Item Number
Sequence)

55-46-2 Standard Transportability Characteristics (Dimensions,
Weight, and Cube) for Military Vehicles and Equipment (in
NSN Sequence)

TECHNICAL MANUALS

38-230-1 Packaging of Materiel: Preservation (Vol I)

38-230-2 Packaging of Materiel: Preservation (Vol II)

38-250 Packaging and Materials Handling: Preparing of Hazardous
Materials for Military Air Shipments

55-208 Railway Equipment: Characteristics and Data

55-315 Transportability Guidance for Safe Transport of Radio-
active Materials

55-601 Railcar Loading Procedures

55-603 Movement of Military Impedimenta by Commercial Carriers

55-625 Transportability Criteria and Guidance for Loading and
Unloading Multilevel Railcars at Military Installations in
the United States

55-1000-205-20-1 Air Transportability Procedures for M38A1C and M151A1C
1/4-Ton Trucks With Mounted 106-mm Recoilless Rifles in
CH-47 Helicopter

55-1015-221-10-2 Air Transportability Guidance: External Transport of the 106-mm Recoilless Rifle Mounted on the M151A1C, 1/4-Ton Truck by UH-1B Helicopter

55-1015-244-12-1 Air Transportability Guidance External Transport of Artillery Firing Platform, M6, by US Army Helicopters

55-1025-200-10-1 Air Transportability Procedures: External Transport of 155-mm Howitzer M114 by CH-47 Helicopter

55-1025-211-14 Transportability Guidance: Transporting the Howitzer, Medium, Towed: 155-mm, M198 by Air, Highway, Water and Rail

55-1040-219-20-1 Transportability Guidance: Service Unit, Flamethrower, Truck-Mounted, M4 and M4A2

55-1055-205-10-1 Transportability Guidance for Launcher, 7.62-mm Rocket, Truck MTD, M386

55-1055-208-12-1 Air Transport of Supplies and Equipment: Honest John Missile System Handling Unit, 7.62-mm Rocket, Trailer-Mounted, M405 w/Rocket, M431, Transported by US Air Force C-130 Aircraft

55-1095-205-14 Transportability Guidance: Dispenser, Mine: Ground Vehicle, M128

55-1400-250-14 Transportability Guidance: Nike-Hercules and Improved Nike-Hercules Air Defense Guided Missile Systems

55-1400-375-20-1 Air Transportability Procedures: Pershing Artillery Guided Missile System (Helicopter Transport Mode) in CH-47 Helicopters

55-1400-379-15-1 Transportability Guidance: Pershing 1A Field Artillery Missile System

55-1400-425-15-1 Transportability Guidance for Redeye Air Defense Guided Missile System, Guided Missile System Intercept-Aerial, M41 in Unipak Container M585 and Monopak Container M571; Shipping and Storage Containers, Guided Missile, Unipak M585 and Monopak M571 and Maintenance Equipment Shelter, GMS, S-408 (XO-1) TSM

55-1400-500-10-4 Transportability Guidance: Hawk Missile System: Loader-Transporter, Guided Missile, XM501 Series

55-1400-500-10-13 Transportability Guidance for Hawk Missile System Shop Equipment, Guided Missile System, Field Maintenance

55-1400-500-15-1 Transportability Guidance: Self-Propelled Hawk and Improved Hawk Air Defense Guided Missile Systems

55-1425-289-14 Transportability Guidance for Roland Missile System Guided Missile Intercept-Aerial (Less Carrier), Roland Fire Units; Carrier, Air Defense (w/Module Loader Mechanism) Missile System, XM1058 Truck Transporter; Shop Equipment, Guided Missile System; Guided Missile, Aerial, XM1M-115 and Shelter Carrier, Truck Cargo; 2 1/2-Ton, M35A2 W/W

55-1425-429-14 Transportability Guidance for Stinger Weapon System

55-1425-470-15-1 Transportability Guidance: Tube-Launched, Optically-Tracked, Wire-Guided Heavy Antitank/Assault Weapon System (TOW) Guided Missile, Surface Attack, BGM-71A (in Shipping Container); Launcher, Tubular, Guided Missile, M220; Carrier, Guided Missile Equipment, TOW; Truck: 1/4-Ton Guided Missile Equipment, TOW, 1/2-Ton and 1/4-Ton; Training Set, Guided Missile System, M70 and Shop Equipment, Guided Missile System, Contact Support, TOW

55-1425-585-15-1 Transportability Guidance (Chaparral Air Defense Guided Missile System) Guided Missile System Intercept-Aerial M54; Carrier, Guided Missile Equipment, Self-Propelled M730; Guided Missile System Intercept-Aerial, Carrier Mounted M48; Shop Equipment, Guided Missile System AN/TSM-95; Shop Equipment, Guided Missile System AN/TSM-96; Guided Missile Intercept-Aerial, M1M-72A in M570 Container and Guided Missile Intercept-Aerial M1M-72B in M570 Container

55-1425-646-14 Transportability Guidance for Launcher, Rocket, Armored-Vehicle Mounted: XM270

55-1430-588-15-1 Transportability Guidance: Forward Area Alerting Radar System (FAAR): Radar Set AN/MPQ-49; Truck, Cargo, 1 1/4-Ton, M561; Trailer, Cargo, 3/4-Ton, M101A1 and Test Set, Radar AN/MPM-57

Section III

PROJECTED PUBLICATIONS

Projected publications are sources of additional information that are scheduled for printing but are not yet available. Upon print, they will be distributed automatically via pinpoint distribution. They may not be obtained from U.S. Army Publications Distribution Centers until indexed in DA Pamphlet 25-30.

FIELD MANUALS

1-101	Aviation Battlefield Survivability
1-116	Air Cavalry/Reconnaissance Troop
(J)1-513	Tactics, Techniques, and Procedures for Aerial Recovery of Aircraft
8-285	Prevention and Medical Management of Laser Injuries
11-999E	Mobile Subscriber Equipment (MSE) Architecture
80-1	US Army Special Operations Forces

Section IV

COMMAND PUBLICATIONS

Command publications cannot be obtained through Armywide resupply channels. Availability may be determined by contacting the address shown.

FIELD CIRCULAR

100-16-1	Theater Army, Army Group, and Field Army Operations, December 1984
----------	---

Deputy Commander
US Army Combined Arms Combat Developments Activity
ATTN: ATZL-CAD
Fort Leavenworth, KS 66027-5300

TRADOC TRAINING TEXT

17-50-3	Joint Air Attack Team Operations, October 1983
---------	--

Commander
US Army Aviation Center
ATTN: ATZQ-CAT-DD
Fort Rucker, AL 36362-5263

FM 1-111
27 AUGUST 1990

By Order of the Secretary of the Army:

CARL E. VUONO
General, United States Army
Chief of Staff

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GLOSSARY

ACRONYMS AND ABBREVIATIONS

A	air
a	assistant
AA	assembly area
AAA	antiaircraft artillery
A ² C ²	Army airspace command and control
AAFES	Army and Air Force Exchange Service
A&L	administration and logistics
aaslt	air assault
AATF	air assault task force
ABMOC	air battle management operations center
abn	airborne
AC	aircraft
ACA	airspace control authority
ACC	air component commander
ACCS	Army command and control system
acft	aircraft
ACO	airspace control order
ACofS	Assistant Chief of Staff
ACP	airspace control plan
ACR	armored cavalry regiment
ACT	air cavalry troop
acty	activity
AD	air defense
ADA	air defense artillery
ADC	area damage control
ADCOORD	air defense coordinator
adj	adjustment
admin	administrative
ADP	automatic data processing
ADPC	Automatic Data Processing Center
ADPE	automatic data processing equipment
AE	aerial exploitation
AEB	aerial exploitation battalion
AF	US Air Force
AFSO	Air force staff officer; aerial fire support observer
AG	Adjutant General
AGL	above ground level
AH	attack helicopter
AHB	assault helicopter battalion
AHC	assault helicopter company
AI	air interception
AIMI	aviation intensive management items
ALO	air liaison officer
ALOC	air lines of communication
ALSE	aviation life support equipment
alt	alternate
altstg	altimeter setting
AM	amplitude modulated

AMC	aviation maintenance company
ammo	ammunition
anal	analyst
ANGLICO	air and naval gunfire liaison company
AO	area of operations
AOE	Army of Excellence
APP	allied procedures publication
approx	approximately
AR	Army regulation
ARFOR	Army force
armt	armament
ARNG	Army National Guard
ARS	air reconnaissance squadron
ARSOA	Army Special Operations Aviation
arty	artillery
ASAC	all-source analysis center
ASARS	advanced synthetic aperture radar system
ASCC	air support coordination center
ASCE	air support coordination element
ASE	aircraft survivability equipment
ASG	area support group
ASL	authorized stockage list
ASOC	Air Support Operations Center
ASP	ammunition supply point
ASPS	all-source production section
assoc	associated
asst	assistant
ASWO	assistant staff weather officer
ATA	air to air
ATACMS	Army tactical missile system
ATAF	allied tactical air force
ATC	air traffic control
ATCCS	Army Tactical Command and Control System
ATGM	antitank guided missile
atk	attack
ATKBN	attack battalion
ATKHB	attack helicopter battalion
ATKHC	attack helicopter company
ATO	air tasking order
ATOC	allied tactical operations center
ATP	ammunition transfer point
ATS	air traffic services
attn	attention
auth	authorized
autm	automation
autmv	automotive
AVGAS	aviation gasoline
AVIM	aviation intermediate maintenance
avn	aviation
AVUM	aviation unit maintenance
AWS	Air Weather Service

BAI	battlefield air interdiction
BCC	battlefield circulation control
BCE	battlefield coordination element
BDA	battle damage assessment
bde	brigade
BDZ	base defense zone
BICC	battlefield information coordination center
BII	basic issue item
blk	block
BMNT	beginning of morning nautical twilight
bn	battalion
BP	battle position
br	branch
BSA	brigade support area
btry	battery
c	cargo airplane
CA	civil affairs
CAA	combined arms armies (Soviet)
CAC	command aviation company
C&J	collection and jamming
CAS	close air support (Air Force)
CB	chemical biological
cbt	combat
C ²	command and control
C ³	command, control, and communications
C ³ CM	command, control, and communications countermeasures
C ³ I	command, control, communications, and intelligence
C ² I	command, control, and intelligence
C ² SRS	command and control strength reporting system
CCT	combat controller team
cdr	commander
CE	Communications-Electronics
CESI	communications-electronics standing instruction
CEWI	combat electronic warfare and intelligence
CFSC	corps finance support center
cGy	centigray (radiation measurement)
CH	chaplain
chap	chaplain
CHEMWARN	chemical warning
CI	counterintelligence
CINC	Commander in Chief
CK	cyanogen chloride
cl	class
CLGP	cannon-launched guided projectile
clk	clerk
cmd	command
cmdt	commandant
CM&D	collection, management, and dissemination
cml	chemical
CMMC	corps materiel management center
CMO	civil-military operations

co	company
COA	course of action
coll	collection
COMINT	communications intelligence
COMJAM	communications jamming
comm	communications
COMMZ	communications zone
comp	component
compo	composition
COMSEC	communications security
CONEX	container express
CONOPS	continuous operations
CONUS	continental United States
COOP	Continuity of Operations Plan
coord	coordinate
COSCOM	corps support command
CP	command post
CRAF	Civil Reserve Air Fleet
CS	combat support
CSA	corps storage area
CSAR	combat search and rescue
CSG	corps support group
CSM	command sergeant major
CSR	controlled supply rate
CSS	combat service support
CST	combat support troop
CT	counterterrorist
CTA	common table of allowances
CTOC	corps tactical operations center
ctr	center
ctrl	control
CTT	commander's tactical terminal
CW	chemical warfare
CZ	combat zone
DA	density altitude
DAG	division artillery group (Soviet)
DAO	division ammunition officer
DCofS	Deputy Chief of Staff
DCSPER	Deputy Chief of Staff for Personnel
DD	Department of Defense
decon	decontamination
def	defense
det	detachment
DF	direction finding
DISCOM	division support command
div	division
DIVARTY	division artillery
DLA	Defense Logistics Agency
DMMC	division materiel management center
DOD	Department of Defense
dpt	depart

DRB	division-ready brigade
DS	direct support
DS2	decontaminating solution 2
DSA	division support area
dspo	disposal
DSS	direct support system
DSU	direct support unit
DT	demanding task
DTG	date-time group
DTOC	division tactical operations center
dvr	driver
DZ	drop zone
EA	engagement area
EAC	echelons above corps
EACIC	echelons above corps and intelligence center
ECCM	electronic counter-countermeasures
ech	echelon
ECM	electronic countermeasures
EENT	end of evening nautical twilight
eff	effective
EH	electronic helicopter
EIR	essential intelligence requirement
elct	electronic
ELINT	electronic intelligence
elm	element
EMNT	end of morning nautical twilight
EMP	electromagnetic pulse
engr	engineer
enl	enlisted
EOD	explosive ordnance disposal
EODC	explosive ordnance disposal center
EPW	enemy prisoner of war
equip	equipment
ESM	electronic warfare support measures
ESSS	external stores support system
EW	electronic warfare
EXJAM	expendable jammer
FA	field artillery
FAA	forward assembly area
FAAD	forward area air defense
FAAO	field artillery air observer
FAAR	forward area alerting radar
FAC	forward air controller
FAC-A	forward air controller-airborne
FAIO	field artillery intelligence officer
FARP	forward arming and refueling point
FASCAM	family of scatterable mines
FASCO	forward area support coordinator
fax	facsimile
FCC	Flight Coordination Center

fd	food
FEBA	forward edge of the battle area
FID	foreign internal defense
FIST	fire support team
fld	field
FLIR	forward-looking infrared radar
FLOT	forward line of own troops
flt	flight
FM	frequency modulated; field manual
FMC	fully mission capable
FM(S)	frequency modulated (secure)
FOB	forward operations base
FOC	flight operations center
FOD	foreign object damage
FORSCOM	United States Army Forces Command
FRAGO	fragmentary order
FROG	free rocket over ground
FS	fire support
FSB	forward support battalion
FSCL	fire support coordination line
FSCORD	fire support coordinator
FSE	fire support element
FSO	fire support officer
FSSE	forward service support element
FST	finance support team
FSU	finance support unit
ft	feet
FTI	fixed target indicator
func	function
FUP	forward unit position
fwd	forward
G1	Assistant Chief of Staff, G1 (Personnel)
G2	Assistant Chief of Staff, G2 (Intelligence)
G3	Assistant Chief of Staff, G3 (Operations and Plans)
G4	Assistant Chief of Staff, G4 (Logistics)
G5	Assistant Chief of Staff, G5 (Civil Affairs)
GEMSS	ground emplaced mine scattering system
gen	general
gnd	ground
gp	group
GP	general purpose
grn	green
GRREG	graves registration
GRU	Main Intelligence Directorate (Soviet)
GS	general support
GSE	ground support equipment
GSM	ground station module
GSR	ground surveillance radar
GS-R	general support-reinforcing
GSU	ground support unit

GTA	graphic training aid
GTD	guard tank division (Soviet)
HA	holding area
hel	helicopter
HEMTT	heavy expanded mobility tactical truck
HF	high frequency
HHB	headquarters and headquarters battalion
HHC	headquarters and headquarters company
HHD	headquarters and headquarters detachment
HHT	headquarters and headquarters troop
HIDACZ	high-density airspace control zone
HIMAD	high-to-medium altitude air defense
HMMWV	highly mobile multipurpose wheeled vehicle
HN	host nation
HNS	host nation support
HPT	high-payoff target
hr	hour
HQ	headquarters
HTH	highway traffic headquarters
HUMINT	human intelligence
HVT	high-value target
hvy	heavy
IA	imagery analysis
IEW	intelligence and electronic warfare
IEWSE	intelligence and electronic warfare support element
IFF	identification, friend or foe (radar)
IFR	instrument flight rules
IGRV	improved Guardrail V
IHFR	improved high-frequency radio
illum	illumination
IMINT	imagery intelligence
in	inch
IN	infantry
ind	individual
indef	indefinite
info	information
int	intelligence
intcp	interception
intel	intelligence
intg	interrogation
INTREP	intelligence report
INTSUM	intelligence summary
inv	inventory
IPB	intelligence preparation of the battlefield
IPF	integrated processing facility
ir	infrared
ITO	installation transportation officer
ITR	independent tank regiment (Soviet)

J	joint
J3	Operations Directorate
JAAT	joint air attack team
JAG	Judge Advocate General
JCS	Joint Chiefs of Staff
JFACC	joint forces air control center
JP	jet petroleum
KIA	killed in action
km	kilometer
kt	knot
lat	latrine
LCC	land component commander
LCSU	logistics composite support unit
LD	line of departure
LIC	low-intensity conflict
LID	light infantry division
LLAD	low-level air defense
LLTR	low-level transit route
LO	liaison officer
loc	location
LOC	line of communication
log	logistics
LOGO	logistics order
LOGOS	logistics operations
LOI	letter of instruction
LOS	line of sight
LPU	limited production--urgent
LRSU	long-range surveillance unit
LSA	logistics support area
lt	light
LZ	landing zone
MAC	Military Airlift Command
maint	maintenance
MANPADS	man-portable air defense
MASH	mobile Army surgical hospital
mat	materiel
max	maximum
MBA	main battle area
MCA	movement control agency
MCC	movement control center
mdm	medium
mech	mechanized
med	medical
MEDEVAC	medical evacuation
MET	missile escort team
METT-T	mission, enemy, terrain, troops, and time available
mgt	management
MHB	medium helicopter battalion
MI	military intelligence

MIA	missing in action
MILVAN	military-owned demountable container
min	ministry; minimum
MLRS	multiple launch rocket system
mm	millimeter
MMC	materiel management center
MOA	memorandum of agreement
MOGAS	motor gasoline
MOPP	mission-oriented protective posture
MOS	military occupational specialty
MOUT	military operations on urbanized terrain
mov	movement
MP	military police
MR	motorized rifle (Soviet); moonrise
MRD	motorized rifle division (Soviet)
MRE	meal ready to eat
MRL	multiple rocket launcher
MRO	materiel release order
MRR	minimum-risk route
MSB	main support battalion
MSD	minimum safe distance
MSE	mobile subscriber equipment
msg	message
msl	missile
msn	mission
MSR	main supply route
MST	maintenance support team
MTI	moving target indicator
MTMC	Military Traffic Management Command
MTOE	modification table(s) of organization and equipment
mtr	mortar
MUSARC	Major United States Army Reserve Command
MWR	morale, welfare, and recreation
NAAK	nerve agent antidote kit
NAI	named area of interest
NASP	National Airspace System Plan
NATO	North Atlantic Treaty Organization
NAVAID	navigational aid
NBC	nuclear, biological, chemical
NBCWRS	NBC warning and reporting system
NC	node center
NCA	national command authority
NCO	noncommissioned officer
NCOIC	noncommissioned officer in charge
NCS	net control station
NGLO	naval gunfire liaison officer
NICP	national inventory control point
NLT	not later than
no	number
NOE	nap-of-the-earth
noncom	noncommunication

NTE	not to exceed
NVD	night vision device
obj	objective
OEG	operational exposure guidance
ofc	office
off	officer
OH	on hand
OIC	officer in charge
OMG	operational maneuver group (Soviet)
op	operation
OPCOM	operational command
OPCON	operational control
OPLAN	operation plan
OPORD	operation order
ops	operations
OPSEC	operations security
OR	operational readiness
ord	ordnance
orgn	organization
ORI	operational readiness inspection
OST	order ship time
OV	orbiting vehicle
PA	pressure altitude
P&A	personnel and administration
PD	performance degraded
pers	personnel
PERSCOM	United States Army Personnel Command
petrol	petroleum
Ph	probability of hit
photo	photograph
PIR	priority intelligence requirement
PL	phase line
PLL	prescribed load list
plt	platoon
PMC	partially mission capable
PMCS	Preventive Maintenance Checks and Services
PNL	prescribed nuclear load
POC	point of contact
POD	port of debarkation
POE	port of embarkation
POL	petroleum, oil, and lubricants
POM	preparation for oversea movement (units)
POR	preparation of replacements for overseas movement
PP	passage point
proc	processing
prog	program
prop	property
PS	personnel services
PSC	personnel service company
psi	pounds per square inch

PSS	personnel service support
PSYOP	psychological operations
pwr	power
PWRS	pre-positioned war reserve stock
PZ	pickup zone
QA	quality assurance
QL	Quick Look
QSTAG	Quadripartite Standardization Agreement
qty	quantity
RAG	regimental artillery group (Soviet)
RAOC	rear area operations center
RATELO	radiotelephone operator
RATT	radio teletypewriter
RAU	radio access unit
RC	reconnaissance cargo
RDF	radio direction finder
regt	regiment
regtl	regimental
rep	representative
RETRANS	retransmission
rfl	rifle
RFL	restrictive fire line
rkt	rocket
RL	readiness level
ROA	restricted operations area
ROE	rules of engagement
RP	release point
ROZ	restricted operations zone
rpr	repair
RPM	revolutions per minute
RPV	remotely piloted vehicle
rqmt	requirement
RSR	required supply rate
RTOC	rear tactical operations center
RU	reconnaissance utility
S1	Adjutant (US Army)
S2	Intelligence Officer (US Army)
S3	Operations and Training Officer (US Army)
S4	Supply Officer (US Army)
SAAFR	standard-use Army aircraft flight route
SAM	surface-to-air missile
SAR	search and rescue
S&S	supply and service
SCC	System Control Center
SEAD	suppression of enemy air defenses
sec	section
SEMA	special electronic mission aircraft
SEN	small extension node
SERE	survival, evasion, resistance, and escape

SF	Special Forces
SFOB	Special Forces Operational Base
sgt	sergeant
SHORAD	short-range air defense
SICPS	signal intelligence command post system
SIDPERS	Standard Installation/Division Personnel System
SIF	selective identification feature
SIGINT	signals intelligence
SIGSEC	signals security
sit	situation
SITREP	situation report
SLAR	side-looking airborne radar
SLOC	sea lanes of communication
SMCT	soldier's manual of common tasks
SO	special operations
SOA	special operations aviation
SOC	special operations command
SOF	special operations forces
SOI	signal operation instructions
SOP	standing operating procedure
SOR	specific orders and requests
sp	specialist
SP	start point or self-propelled
spec	special; specialist; specific
SPO	security, plans, and operations
SPOTREP	spot report
spt	support
sqd	squad
sr	senior
SR	sunrise; special reconnaissance
SRINF	shorter range intermediate-range nuclear force (Soviet)
SS	sunset
SSB	single sideband
SSM	surface-to-surface missile
STANAG	Standardization Agreement
STB	supertropical bleach (caustic decontaminant)
std	standard
STP	soldier training product
STRIKWARN	strike warning
subj	subject
subs	substitutes
sup	supply
SUPCOM	support command
surve	surveillance
svc	service
SWO	staff weather officer
synch	synchronize
sys	systems
T2	tricothecene toxin
TA	theater army; tank Army (Soviet)
TAA	theater army area

TAACOM	Theater Army Area Command
TAADS	The Army Authorization Documents System
tac	tactical
TAC	tactical air coordinator
TAC(A)	tactical air coordinator (airborne)
TACAIR	tactical air
TACC	tactical air control center
TACCS	Tactical Army CSS Computer System
TACFIRE	tactical fire
TACJAM	tactical jamming
TACP	tactical air control party
TACS	tactical air control system
TAF	tactical airforce
TAI	tactical area of interest
TAMCA	Theater Army Movement Control Authority
TAMMC	Theater Army Materiel Management Center
TARP	target acquisition reconnaissance platoon
TASOC	Theater Army Special Operations Command
TC	training circular
TCAE	technical control and analysis element
TCC	transportation coordination center
TCC(A)	transportation coordination center (air)
TCF	tactical combat force
TD	tank division (Soviet)
TDA	theater defense aviation
TDAB	theater defense aviation battalion
tech	technician or technical
TEL	transponder erector launcher
temp	temperature
TENCAP	tactical exploitation of national space capabilities
TF	task force
TFU	tactical forecast unit
tgt	target
THREATCON	Threat condition
tk	tank
TLE	target location error
tm	team
TM	technical manual
TMO	transportation movement office
TMT	transportation motor transport
TOC	tactical operations center
TOE	table(s) of organization and equipment
tot	total
TOW	tube-launched, optically tracked, wire-guided (missile)
TR	tactical reconnaissance
TRADOC	United States Army Training and Doctrine Command
trans	transportation
TRANSCOM	transportation command
trk	truck
trn	train
TRP	target reference point
trp	troop

TSA	theater storage area
TV	television
typ	typist
U	utility airplane
UAV	unmanned aerial vehicle
UH	utility helicopter
UHF	ultra high frequency
US	United States (of America)
USAF	United States Air Force
USAR	United States Army Reserve
USMC	United States Marine Corps
USN	United States Navy
USO	United Service Organizations
USSR	Union of Soviet Socialist Republics
UT	undemanding task
UW	unconventional warfare
veh	vehicle
VFR	visual flight rules
VHF	very high frequency
vic	vicinity
VTA	Air Forces Military Transport Aviation (Soviet)
VTDP	vectoring and target designating point
w	with
WETM	weather team
WFZ	weapons-free zone
WIA	wounded in action
WO	warrant officer
wpn	weapon
WW	Wild Weasel
wx	weather
XO	executive officer
Z	zulu (Greenwich Mean Time)

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Yellow rain, E-10, E-11

PIN: 060496-000